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THESIS

ASSESSMENT OF THE APPLICABILITY
OF TOTAL QUALITY LEADERSHIP
INTO THE ARGENTINE ARMY

by

Gustavo A. Landa

March, 1995

Thesis Advisor:

Linda Wargo

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TOTAL QUALITY LEADERSHIP INTO THE ARGENTINE ARMY

by

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Major, Argentine Army
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Submitted in partial fulfillment
of the requirements for the degree of

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from the

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ABSTRACT

The purpose of this thesis is to assess the possibility of success for a Total Quality Leadership program to be implemented in the Argentine Army. If success is found to be possible, the proper steps for making the TQL transformation will be analyzed. A survey was designed and administered to six Generals at the Argentine Army Headquarters to find if Dr. Deming's philosophy, the TQL foundation is shared by the Argentine Army staff.

The survey analysis showed that most of the Deming's philosophy is shared by the Argentine Army staff. This finding was correlated with current TQL literature and a subjective analysis of the Argentine Army as an organization. A transformation plan was developed including the necessary steps for the introduction of TQL in the Argentine Army. In addition to the plan, some recommendations were enumerated for increasing the probability of success for this program.

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I. INTRODUCTION

This chapter gives the reader a basic knowledge for a better understanding of this study. The thesis objective, scope, limitations, and organization are defined as well.

A. BACKGROUND

1. The American Society and Quality

In 1910 the half of the products manufactured in the world were made by the United States (U.S.). American managers became accustomed to prioritizing quantity over quality [Ref 3:p 3].

Following World War II, the U.S. was the only industrialized country with an intact capacity to satisfy world desires for manufactured products. The market was there; whatever was produced could be sold. The concept of quantity over quality was reinforced.

Japanese industry was revitalizing their manufacturing processes, but their products were of poor quality and unreliable. Japanese managers turned their manufactured processes around by adopting W. Edwards Deming's philosophy in the early 1950s (see Chapter III, LITERATURE REVIEW). By 1980, Japan's products held an important share of both the U.S. and world market.

In 1980, a documentary television program titled "If Japan Can...Why Can't We?", drew the interest of the U.S. on the importance of quality in world competitiveness. Many companies learned the lesson: customers care about Quality, and the customers are always right. Companies like GM, Chrysler, Ford, Xerox, Kodak, AT&T, IBM and American Express are a few examples of companies from the private sector who took this lesson seriously. The U.S. government is also incorporating quality throughout its organization [Ref 7:p iii].

Today American society understands and uses the word "Quality" in its daily vocabulary.

2. The Department of Navy (DON) and Quality

Most of the information of this section was derived from Suarez, J.G., Three Experts on Quality Managers: Philip B. Crosby, W. Edwards Deming, Joseph M. Juran, DON TQL Office, 1992.

The DON approach to quality improvement is called "Total Quality Leadership" or TQL (see Chapter III, Section F for further explanation).

After analyzing various approaches to quality management, the leaders of the Navy concluded that Deming's philosophy would best fit the unique characteristics of the Navy. The Deming approach emphasizes leadership responsibility, which is congruent with the military culture.

The DON approach to total quality has evolved over a decade. Aviation depots and naval shipyards have been involved since the early 1980s. In 1989, the Naval Air Systems Command was the first Navy recipient of the Presidents' Award for Quality, a testimony to their long-term efforts to improve organizational performance.

Although DON's approach had been successfully implemented in most types of shore facilities by 1991, the question remained: "Does TQL work in the Fleet?" ADM Frank B. Kelso II, Chief of Naval Operations (CNO), tasked the DON TQL Office to train 20 military personnel from the aviation, surface and submarine communities to work with demonstration organizations in each community to implement TQL in the Fleet [Ref 11:p V]. In November of 1993, the DON TQL Office authored a document summarizing the fleet experiences [Ref 11].

Another measure of the commitment of the U.S. Navy to TQL is the widespread TQL education available and required of all personnel, including senior officers. This education and training strategy is discussed in the literature review.

3. TQL in Other Countries

The Department of the Navy, Total Quality Leadership Office has collaborated with other countries such as: Argentina (at government level), Australia, Belgium and Brazil to assist in introducing TQL principles. Leaders in these countries have either taken seminars or have received information related to the TQL experiences of the U.S.

Navy [Ref 12]. The degree of efforts in these countries vary from the adoption of a new management philosophy known as Navy Quality Management (NQM) in the Royal Australian Navy [Ref 13] to a lack of evidence of changes in other countries.

4. The Argentinean Culture and its Influence in this Thesis

Argentinean culture is different from the American culture. Although a deep analysis of both cultures is not possible in this thesis, it is important to point out the most important differences. The Argentinean culture will relate to TQL differently than the U.S.

Argentinean people think less about money than American people. This characteristic is particularly important for analysis of decision making situations. For instance, in a cost/benefit analysis, intangible factors may be emphasized by an Argentinean. On the other hand, "the bottom line" (money) will play a more important role when the analysis is made by an American.

The TQL principles and examples in the analysis of this thesis are viewed from the Argentinean perspective.

5. TQL in the Argentine Army

TQL in the Argentine Army (AA) at this time means nothing. Although contacts have occurred between the DON and the Argentinean government, no sign of TQL is visible in the AA.

Following a long period of unstable institutional life, the Republica Argentina is learning how to live democratically, but distrust still exists between the political and military factions. This is reflected by the lack of resources allocated for the Armed Forces.

The AA faces the same climate for change as the USN: budgeting cuts, downsizing in all fields (personnel, material, financial, etc.), with the responsibility of the national defense remaining exactly the same. This thesis examines whether TQL can assist in the improvement of the Argentine Army.

B. OBJECTIVE AND RESEARCH QUESTIONS

1. The Objective

The main objective of this thesis is to decide whether TQL is applicable to the Argentine Army and if so, to determine the most appropriate first steps for introducing the new philosophy (Deming - TQL) into the Argentine Army.

2. Research Questions

There are two basic research questions in this thesis:

- Is TQL applicable to Argentine Army?
- If so, what steps need to be taken to create the TQL transformation?

To answer the first and most important of the research questions, four investigative questions were defined:

- Is the Argentine Army willing to make a long-range transformation, which could take years?
- Does the Argentine Army understand that innovation, research, continual improvement and maintenance are key tools to accomplish its mission?
- Does the Argentine Army give the right priority to education, training and leadership?
- Is the Argentine Army willing to empower the lower levels of its structure to give them the opportunity to create new ideas and procedures?

These investigative questions were asked as the foundation for a mail survey to the Generals assigned at the AA Headquarters (Appendix).

The second research question was answered based upon the survey results, the guidelines provided by the Navy Personnel Research and Development Center (NPRDC), and other consulted literature.

3. Scope, Limitations and Assumptions

a. Scope

The scope of this thesis is to investigate whether or not the appropriate conditions for introducing TQL exist in the Argentine Army, and if so, what steps can be taken to create a successful transformation using the DON as an example.

b. Limitations

The amount of literature written on TQL has grown exponentially in recent years. The author was limited to the six month time frame of the thesis in conducting his literature review. Therefore, not all possible documentation on TQL and its implementation was able to be reviewed.

The Officers selected from the Argentine Army to complete the sample survey (all generals appointed in the Argentine Army Headquarters (approximately six)) may or may not represent the opinion of the entire population of the army or even the entire population of senior Officers. A certain degree of bias may thus be present in the survey analysis as well as in the conclusions of this thesis.

c. Assumptions

This thesis assumes the reader has no knowledge about the Total Quality Leadership philosophy and the U.S. Navy's effort to implement TQL in the fleet and its results. It also assumes the reader has the needed background to understand the methodology and research tools used in this thesis.

C. ORGANIZATION OF THE STUDY

Chapter I provides a brief introduction and background of the study.

Chapter II describes the methodology followed to reach the objectives set in Chapter I.

Chapter III summarizes Dr. Deming's philosophy, the DON approaches to this discipline, and the experience gained by the Navy.

Chapter IV relates the results of the survey to the first research question and its interpretation.

Chapter V provides a blueprint of suggested steps to accomplish the TQL transformation.

Chapter VI summarizes the findings and provides a conclusion on the results of the thesis.

The Appendix contains the survey mailed to the Argentine Army headquarters.

II. METHODOLOGY

This chapter describes the methodology used to gather and analyze the data to answer the research questions. Two main sources of data were utilized: a literature review and a survey.

A. LITERATURE REVIEW

An important step in the formulation of this thesis was a review of current literature about TQL. The aim of this phase was to become clear about what needs to be done in an organization to accomplish the TQL transformation. This was accomplished by reading several books and by comparing the different references for common agreement on main ideas. This knowledge became the foundation for the survey instrument development and for the Transformation Plan.

B. SURVEY

1. Survey Design

The survey was designed with the intention of finding out if the Argentine Army's staff, consciously or subconsciously, supports the TQL principles. To accomplish this goal, a survey instrument (See the Appendix) composed of fourteen questions was prepared, associating each question with one or more of Deming's 14 points. The author drew on his personal experience as well as his reviews of current TQL literature to compose the questions.

Of the different methods usually applied to conduct a survey, such as personal interviewing, telephone interviewing and mail survey [Ref 4 - Chap 10], the mail survey was selected. Personal interviewing was considered infeasible, requiring unavailable funding and taking too much time. Telephone interviewing was considered possible but difficult, given the high rank of the selected respondents and also its cost. However, this method was kept as an alternative to clarify any doubt over answers to the questionnaire. Because a mail survey was more cost effective and timely, it was considered to be the

appropriate instrument for this research. An added benefit was that the mail survey provided respondents time to reflect on the questions. The standard major weaknesses of a mail survey, nonresponse and the lack of cooperation with a long or complex questionnaire [Ref 4:p 333], were avoided through a preliminary notification sent to respondents and by developing an instrument with no more than fourteen simple questions.

Phone follow-ups on nonrespondents were considered after a defined deadline, via the Argentine Army Military Attache Office. If a respondent did not answer the questionnaire within twenty days after a follow-up call, no further action was taken. The nonresponse rate was taken into account during the analysis of data collected.

The purpose of this survey was not disguised. However, Argentine Army specific wording was used to make it easier for respondents to understand the questions, which could be considered a degree of disguise. For example, personal experience suggested the avoidance of words such as "customers." Doing this prevented a prejudice by the Army Staff that TQL is the property of the business world.

Finally, a pilot survey was administrated to Argentine students currently attending the Naval Postgraduate School and DRMI. The survey was adjusted according to these test results.

2. Sample Selection

A nonprobabilistic sample (all Generals assigned to the Argentine Army Headquarters, approximately six) was selected to be the survey respondents, mainly because the expected tradition is that one of them will become Chief of the Army in the near future. This fact was considered extremely important given that support for the TQL philosophy by the future Chief of the Army and other key leaders will be necessary for the new philosophy to be accepted at the Argentine Army staff level (Deming's points 1 and 2).

This sample also establishes the purpose of a research question: to get a feel for how open the Argentine Army is to the introduction of TQL principles. *In addition*, given that TQL needs a top leader's support to be successful and that there is a particularly

strong vertical chain of command in the Argentine Army, it was only necessary that the sample reflect the senior leadership.

C. ANALYSIS OF DATA COLLECTED

The nonprobabilistic sample selected simplified the analysis of the collected data. In-depth statistical analysis was not necessary to recognize if TQL principles are supported by the Army staff. A simple mean and frequency distribution sufficed.

It was necessary in some questions to translate the likert scale used in the survey form to a numerical one. An "0" value was assigned to "Strongly Disagree," "1" was allocated to "Disagree," "2" was attached to "Undecided," "3" was assigned to "Agree" and "4" was allocated to "Strongly Agree."

D. COMPARISON OF SURVEY ANALYSIS WITH LITERATURE REVIEW RESULTS

The Literature Review provided the "what should be" in terms of creating a TQL transformation while the analysis of data collected provided the current state of the Argentine Army with respect to readiness for TQL. A comparison of the information in these two sections presents a picture of the internal forces for and against a TQL transformation. Additionally, as the Army operates in a large environment, this environment was scanned to recognize opportunities and threats associated with the idea of introducing TQL in the Army. All this information was used to identify the necessary actions to create the transformation.

III. LITERATURE REVIEW

The purpose of this chapter is to provide the readers some basic knowledge about TQL to create a better understanding of this thesis and to provide the first step toward introducing TQL in the Argentine Army.

The chapter consists of six sections which summarize the most relevant concepts used by the United States Navy (USN) to train its personnel in this discipline [Ref 1].

A. INTRODUCTION TO TOTAL QUALITY

1. History

Following War World II, Japan faced the difficult task of rebuilding its nation. Many scientists and specialists were sent to help in the reconstruction. One of these experts was Dr. W. Edwards Deming. Dr. Deming introduced his concepts about management practices, a well-educated and trained work force, and the understanding and use of simple statistical techniques. One concept was that through quality, industries could reach unexpected levels of productivity. The results of his and other quality experts' efforts are known by everybody: a nation that was almost ashes is today an economic giant. [Ref 1:p 4]

At the beginning of the 1980s the American society began realizing the importance of quality in an increasingly competitive world and worked to catch up [Ref 7:p iii].

DON became involved in quality initiatives in the early 1980s, facing a challenge of becoming a more efficient and effective organization in the face of massive budget cuts, while maintaining the level of national defense [Ref 7:p iii].

2. Basic Concepts and Definitions

This section provides some basic definitions and concepts which may help the reader understand other major concepts discussed in later sections.

a. How Can We Define Quality?

First of all, it is necessary to understand that the definition of quality depends on: context, perception and needs and wants of the customer [Ref 1:pp 1-7].

For instance, for computer software (the context), the customer might define quality as reliability. Although most users are not able to measure the reliability of software, they have some kind of feeling about it (the perception). They also require a friendly interface and good technical assistance (the needs), but if they were asked to describe the features, they would probably like software with multimedia capabilities although they do not need it (the wants).

This means that to define the quality of products and services it is important to know who the customers are, how the customers perceive the product and also, if they change their perception about the product [Ref 1:pp 1-7].

Dr Deming stated:

The difficulty in defining quality is to translate **future needs** of the users into **measurable** characteristics, so that a product can be **designed** and turned out to give **satisfaction** at a **price** that the users will pay [Ref. 2: p. 169].

Future needs. This means that top leadership must look forward 5 to 10 years. Customer research must be conducted to identify future needs. Likewise capabilities to meet those future needs should be planned for now.

Users means customers. In general, two types of customers need to be satisfied: external customers and internal customers. External Customers are those individuals/groups outside of the organization who use its products or services. Internal Customers are any person or group within the organization who receives a product or service from somebody else in that organization. Given that everybody in an organization receives a product or service as well as delivers a product or service to somebody else, all personnel in the organization are not only customers but also suppliers. It is important to clarify those customer-supplier relationships and to focus the organization on meeting both types of customers' needs.

Measurable. Once we recognize what aspects of the product are important for the customers, we need to determine what measures we should take to ensure we are meeting the customers needs in those areas. This measurement system will guide decisions about areas to focus on for improvement.

Design. The organization should have a system to incorporate the customers' needs into the design of the product or services. Design is one of the earliest stages of product or service development. If we design a product or service to meet customer's needs at this stage, we are avoiding modifications at later stages, which are always more expensive.

Satisfaction. Satisfying users' needs is important, but we need to go further. We have to delight our customers, giving our customer a service or product better than expected. A satisfied customer may switch to another product of the same quality and price; a delighted customer will continue to use the product and will probably tell others about the product (his/her friends) [Ref 1:pp 1-11].

Price. Price is not the same as cost. Price is what the customers pay for products or service. Price components include cost of development, production and profit. Cost includes: from the customer's point of view: price, operational expenses and maintenance.

An example is provided to put the four last concepts into the Argentine Army context. Suppose the AA needs to install a new communication system. Users (any military organization) need to know that the system is there and working properly. If we assume that if the system is functioning the way it is supposed to, we can say that the users need a "reliable" system, in this case, the mean time between failures is a proper measure. If the designers of the AA communication system take into account the users needs, they should foresee in the design phase alternative equipments and links to guarantee the functioning of the system. Military units can accomplish part of their communication requirement using private companies, so if the AA communication system does not satisfy customers' needs, the users will switch to another supplier. If that happens, the AA would have wasted part of its scarce resources in a communication

system that nobody uses. Finally, when the time to buy comes, the temptation to buy the cheapest (this is the price) equipment that meets the specification is always present. If the Argentine Army buys inexpensive communication equipment, but the system becomes unreliable or is not able to endure the demand of the military activities, the AA would face long-term high, maintenance costs.

b. Deming's Chain Reaction For Quality Improvement

Folklore in America says that quality and production are incompatible [Ref 2:p 1]. American managers believe that if they try to reach a high level of quality, production levels will drop, thereby raising the cost per unit. In other words, high quality means high cost.

Dr. Deming's Chain Reaction shows differently (See Figure 3-1).

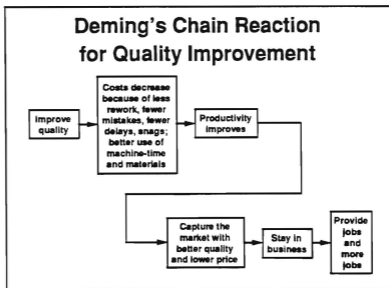


Figure 3-1. Deming' Chain of Reaction [Ref 114:pp 1-44].

Deming's statement "improve quality," means build quality into the production process. Inspections following production are too late. It is important to note that improving productivity focuses on improving quality, not quantity.

c. Department of the Navy (DON) Chain of Reaction

The Department of the Navy adopted the Deming chain reaction and defined it for the DON as follows (Figure 3-2):

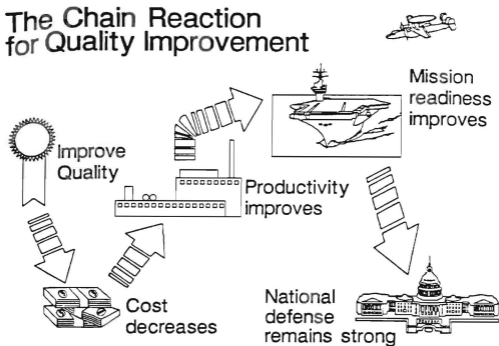


Figure 3-2. DON's Chain Reaction [Ref 21: p 1-12].

Note that instead of providing jobs, the DON believes that focusing on improving quality directly improves National Defense.

d. What Does Total Quality Leadership (TQL) Mean?

Total Quality Leadership (TQL) is the term used to describe the DON approach to quality improvement. **Total** refers to the whole system. The system is composed of all processes, all people including customers and suppliers. **Quality** is reflected in the products as defined by the customer. **Leadership** means that top-down leadership is necessary to undertake and achieve the cultural transformation required to reach the goal of creating a total quality organization. [Ref 14:pp 1-51]

The formal DON definition of TQL is as follows:

TQL is the application of quantitative methods and the knowledge of people to assess and improve:

- Materials and services supplied to the organization.
- All significant processes within the organization.
- Meeting the needs of the end-user, now and in the future [Ref 14:pp 1-52].

Supported by these concepts and this definition, a Total Quality Model has been created (Figure 3-3). The model shows three fundamental elements.

- Incoming materials and services: the quality of incoming materials and services attribute directly to the end product. If inputs are not of high quality, the direct result is waste and increased cost.
- Significant Internal Processes: these are processes with a major contribution to the organization mission or to specific product or service.
- Customer perceived quality: If we do not pay attention to the needs of the end-users, goods or services may be produced that customers will not buy.

The interconnecting arrows between the three elements represent: (a) a decision to accept or reject a product or service (forward arrow), and (b) feedback for product improvement

(backward arrow). In the case of the third element, 'Customer-perceived' Quality, there are two feedback arrows. The solid-line feedback arrow represents customers information about the quality of the products or services being received. The dotted-line feedback arrow represents marketing information for future requirements and/or innovations that may yield products not now known by the customer. [Ref 1:pp 1-29]

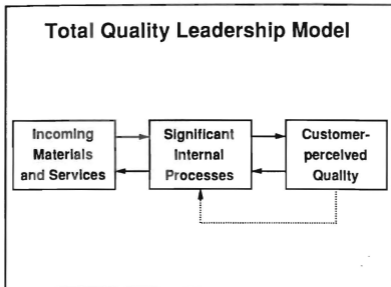


Figure 3-3. Total Quality Leadership Model [Ref 14:pp 1-53].

e. Definition of a Process

A process is "a series of operations or steps that result in a product or service" or "a set of causes that work together to produce an effect" [Ref 1:pp 2-15]. Some examples of Army processes are:

- Incorporation of soldiers.
- Acquisition of any material.
- Readiness for any military operation or maneuver.
- Planning.
- Training people.

Essentially, processes deal with how the job is done. As there are innumerable processes in an organization, it is possible that process improvement may lead to efficient but not necessarily effective results. Therefore, improvement needs to be focused on critical processes, those that significantly contribute to achieving the organization's mission. These critical processes center around meeting current customers' needs as well as future needs [Ref 1:pp 2 - 17].

B. THE SYSTEM OF PROFOUND KNOWLEDGE

As shown in Figure 3-4, the Deming approach to quality leadership is made up of three elements: "The System of Profound Knowledge," "Deming's 14 points" and the "Plan-Do-Check-Act (PDCA) Cycle."

Deming's System of Profound Knowledge is composed of four interrelated parts: Systems theory.

- Systems theory.
- Variation.
- Psychology of individuals and organizations, learning and change.
- Theory of knowledge.

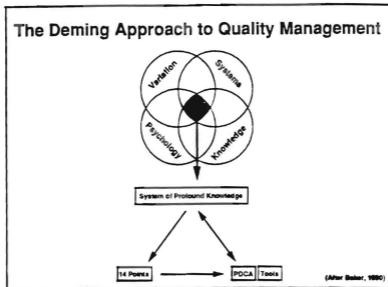


Figure 3-4. The Deming Approach to Quality Management [Ref 14:pp 0-6].

Given that the prevailing style of management must undergo transformation, the change does not occur if the managers lack profound knowledge. "Profound knowledge is a lens which provides the needed theory to optimize organizations" [Ref 3:p 94]. According to Deming, managers need to understand and apply all parts of profound knowledge.

1. System Theory

What is a system? "A system is a collection of parts that interact with each other to function as a whole" [Ref 1:pp 2 - 6]. These collections are often called subsystems.

The system must have a purpose, there is no system if there is no purpose. The purpose is what makes the different parts of the system into a total unit. For instance, "weapon systems" are made up of many subsystems such as:

- People.
- Weapons.
- Computers.
- Software.
- Ammunition.
- Telemeters.
- Vehicle(s).
- Radar.

If each subsystem is viewed separately, it may not make sense to mix software with ammunition. But if the common goal is to select and hit a target, it then makes sense to put all these subsystems together, each contributing to accomplish the aim.

Dr. Deming's vision of a system is shown by using an example of production (Figure 3-5).

The remarkable message included in this graph is the incorporation of suppliers and consumers to the system, as well as the interdependence and interaction among the different parts. Clear boundaries no longer define a system. This graph was shown to Japanese managers in 1950 and it is considered the spark that turned Japan around [Ref 3:p 58].

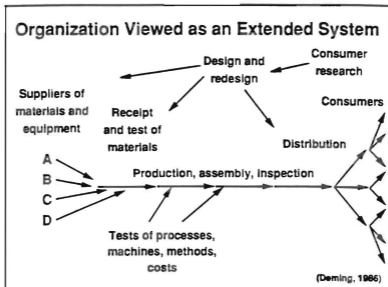


Figure 3-5. Production viewed as a system [Ref 14:pp 2-9].

We can adapt Deming's organization view to the Argentine Army Logistic System (Figure 3-6).

Figure 3-6 shows us (at a macro level), all the components of the AA Logistic System. Suppliers (or vendors) provide or sell material or equipment to the AA. Those materials are received and tested by a Logistic Element. The Logistic Element studies and uses them in experimental form, testing the methods of use as well as their associated cost. Then the new material is distributed to the combat units for normal activities (training, maneuvers). Experiences are reported to the Logistic Command. All gathered information is analyzed and disseminated to all interested parties.

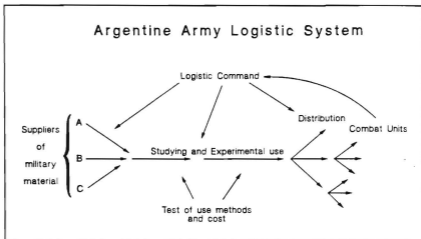


Figure 3-6. The AA Logistic System.

Two important system concepts are **Optimization and Suboptimization of the organization**. **Optimization** is the process of making the entire organization as effective as possible, occurring when each subsystem supports the goals of the organization [Ref 1:p 2-8]. On the other hand, **suboptimization** occurs when the subsystems do not support the goals of the organization [Ref 1:pp 2-10]. A personal example will illustrate the problems with suboptimization.

At the beginning of my career as an officer, the commandants of the different companies within my battalion fought each other to gain a better position for their company in the battalion. Sometimes the winner would be one Captain, other times another, but the loser was always the battalion. Because of the companies' selfishness, the battalion did not receive support from its subsystems (the companies). This situation represents an example of suboptimization.

The above example also points out one of the most important jobs of management, to recognize and manage the interdependence and interaction among components, removing all barriers to cooperation [Ref 3:p 65].

If the organization is viewed as a system, organizational boundaries are no longer easily defined. The organization is no longer limited by walls. From the TQL point of view, if we see our organization as a system we must include suppliers and customers in the system. (See Figures 3-5 and 3-6.)

2. Variation

To vary means to be different from one occurrence to another [Ref 1 p:3-6]. Suppose we are measuring the time spent by a military unit in a deployment. The time is measured from the moment the order to deploy is given until the unit has carried out its deployment. If this situation is repeated many times (with the same order), the record will show different cycle times each time the order was carried out. The different cycle times occur due to natural variation.

Variation is inherent in all processes. Walter Shewhart, a statistician who worked at Bell Telephone Laboratories during the 1920's discovered that when he took many measurements of the same process output, he obtained a distribution of values no matter how many times he performed the measurement. He always found variation [Ref 1:pp 3 - 9].

Process causes of variation may be identified and analyzed. Shewart found in his studies that variation within processes is caused by machines, methods, material, and people working within the processes. By reducing the variation in each cause, the variation of the process output is reduced.

Shewhart developed a control chart to study variation graphically. This graph contains all the collected data (shown as dots) as well as two lines called upper and lower control limits, which are computed from the data. Shewhart recognized two causes of variation from his analysis, Deming ultimately named these as "**common cause variation**" and "**special cause variation.**"

Common cause variation is inherent within the process. It does not matter who is doing the job or when the job is being done, the output will be always affected [Ref 1: pp 3-21]. An example of common cause variation may be, in the case of our military unit, when a defined procedure is followed step-by-step consistently and yet the time spent by the unit always varies. Although the unit is performing at their best, there is always variation in the time to accomplish the procedure.

Common cause variation may be seen in a control chart as measurements which fall within the upper and lower control limits without any discernible pattern. (See Figure 3-7.)

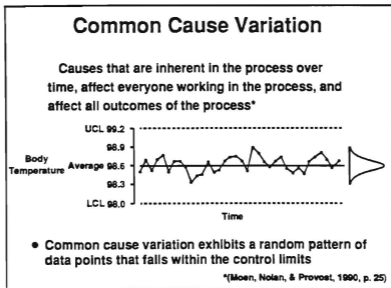


Figure 3-7. Common Cause Variation [Ref 14:pp 3-29].

A process is in **statistical control** (stable) when it has only common causes of variation. Under this condition, the output of the process may be predicted [Ref 2:p 321].

When quality and quantity of a process are predictable, cost is also predictable [Ref 3:p 180]. Having those three variables under control is the foundation for long term planning.

On the other hand, *special cause variation* is not inherent to the process. This type of cause may be identified in a control chart when measurements fall outside of the control limits or occasionally, as patterns of measurements within the limits. (See Figure 3-8)

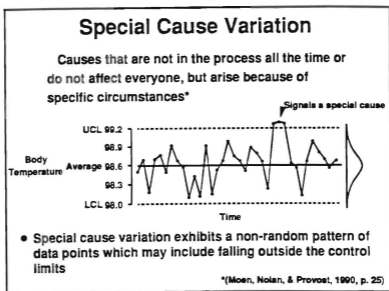


Figure 3-8. Special Cause Variation [Ref 14:pp 3-31].

Suppose there is a crew in charge of cannon in military maneuver. The crew is well trained and it has been recognized to be successful in before exercises. The fire

starts, and the crew hits all assigned targets. Suddenly, the crew starts to fail to hit its targets although the crew is following the same procedure as before. An NCO who is in charge of the cannon decides to check the diameter of the cannon's tube and the finds that the tube is dilated. The crew is moved to another cannon and they start hitting the targets as in the beginning. This is an example of special cause of variation. The problem was caused by the dilated tube of the cannon. After the cannon was replaced, the problem disappeared.

When special causes occur in a process, the process is not in statistical control (also termed unstable). The process output cannot be predicted, thus decreasing the possibility of long term planning.

The first step in improving a process is to remove all special cause variation. Once the process is in statistical control, we can begin studying how to remove common causes. It is very important to identify each cause correctly as the process for eliminating a special cause is different than for common causes. Different management is also required for the improvement of processes [Ref 2:p 319]. **Reduction in common cause variation falls under the responsibility of organizational leadership and the reduction of special cause variation is the responsibility of the people working in the system with leadership assistance** [Ref 1: pp 3-28].

3. Psychology of Individuals and Organizations, Learning and Change

A knowledge of psychology can help leaders understand: their employees, how to work in teams, how people learn and how to change their culture. These are all important for effecting a successful quality transformation.

The major challenge for leaders is to understand people and to help them do a better job. Leaders must provide work methods to allow the workers of the organizations to be proud of their jobs. From Dr. Deming's point of view, this idea is the cornerstone of work motivation [Ref 1: pp 4-4].

One of the key factors of a TQL culture is teamwork. Many benefits come from this. First, as many of the teams are composed of persons from *different parts* of the organization, it is possible to work toward optimization of the system. Teamwork is an

excellent way to decrease suboptimization of the system. Second, as team members acquire ownership of their decisions, intrinsic motivation increases. Third, any actions affecting different areas within the organization become easier to accomplish because the decisions were made across organizational lines and team members are available in each area to work as facilitators for improvements.

It is also important to understand that the learning process is different for each person [Ref 3: p 111]. There is variation in how quickly people learn and in how people learn: some people learn better through reading, others learn better through action. Anyone can learn and improve his/her knowledge. Leaders must find the way to provide learning opportunities and motivation in a manner that is effective for the personnel.

People at different levels of the organization need different skills. Top leaders must have knowledge of planning, how to detect the customers and their needs (current and future), while lower-level managers must know more about process analysis and improvement.

TQL is a cultural change for an organization. The definition of organizational culture is "the patterns of behavior and values that members create for themselves" [Ref 15:p 15]. Culture is the result of many factors such as: external environment, strategy of the organization, tasks, people and organizational structure. Cultural change is a complex task because a culture cannot be modified directly by managers. Managers can work only through the three organizational design factors (people, task and formal organization) to influence culture. Knowing that these three factors interact each with other, a balance among them must be created and maintained [Ref 15: p 23].

4. Theory of Knowledge

The theory of knowledge relates to how knowledge is obtained and how it may be increased. This theory is reflected by the scientific method which is used to advance the state of knowledge in different fields. The scientific method requires formulating a theory, testing the theory, explaining the results or events and predicting future results or events based on the theory. The method also requires collecting, analyzing and

interpreting data about the theory under consideration. Finally, a theory is supported, disproved or modified based on information from data analysis [Ref 1 : pp 5-5].

The goal of the science is to explain past events, to predict future events, and, where possible, control current and future events. Deming thinks that all managers, at all levels, should have the same goal as scientists (explain, predict and control) to gain more knowledge about the system and processes in their organization [Ref 1:pp 5-13].

A TQL transformation does not take place without planning, but planning is impossible without prediction. For this reason, Deming says "The Theory of Knowledge helps us to understand that management in any form is prediction" [Ref 1:pp 5-13]. However prediction is also difficult to achieve without knowledge. The manager of a process cannot understand what the data mean without knowing the process deeply.

This required knowledge must be expressed in an useful form, to help in testing and experimentation. This form is theory, but theory that is stated in a clear way, so that the understanding acquired is exactly the same for all. Operational definitions are the proper tool [Ref 1:pp 5- 15] to achieve this understanding.

Dr. Deming says: "An operational definition puts communicable meaning into a concept" [Ref 2:p 276]. For example, if a military vehicle has a headlight which does not work, is the vehicle inoperative? We must specify when a vehicle is to be considered inoperative, so that anyone in the organization can arrive the same answer.

Another benefit of knowledge is that the organization learns new approaches to planning and decision-making. Instead of reacting to problems, an organization can plan for improvements and focus resources toward solving the roots of the problems, rather than attacking their symptoms.

Knowledge gives us the capability to make data-based decisions instead of "shoot from the hip" (emotional) decisions. Organizations which spend time testing different theories have the opportunity to collect data to support their decisions.

Knowledge also allows organization to make long-term decisions. Usually organizations are driven by emergencies instead of what is important. Decisions made under these conditions only look for short term results. On the other hand, with data to

support knowledge such as "the delayed effects on the systems" [Ref 3:p 64] and long term vision, decisions may be accepted that have undesired effects in the short term, but favorable effects in the long term.

C. DEMING'S FOURTEEN POINTS

Deming's fourteen points are the major principles of total quality leadership. These points must be shared and understood by an organization before undertaking a TQL transformation. For TQL to become a reality, support from the top leaders is essential. Following each point, there is an explanation from an army context:

Point 1: *Create and publish to all employees a statement of the aims and purposes of the company or other organization. The management must demonstrate constantly their commitment to this statement.* [Ref 1: pp 7-5]

Creating and publishing the aims and purpose of the Argentine Army is a particularly significant event. Soldiers rely absolutely on the word of their senior leadership. This implies that senior leadership must truly believe in and act in accordance with the TQL philosophy for all levels of the organization to accept it [Ref 2:pp 25-26].

Point 2: *Learn the new philosophy, top management and everybody.* [Ref 1: pp 7- 8]

The Argentine Army, like the USN, is affected by a global downsizing. This trend translates to less resources (budget and personnel) each year. The DON adopted a change in its philosophy, "We (DON) must provide the best defense possible within the budget provided by Congress. To do this, we need to learn the new philosophy. We cannot tolerate waste, rework, and delays that are caused by poorly designed and poorly managed systems and processes." [Ref 1: pp 7-9]

Although the Argentine Army's resources are many multiples smaller than DON budget, the Army has the same obligation: to provide the best defense possible to Argentina within the allocated budget. The AA should adopt a philosophy transformation as well, using DON as an example.

Point 3: *Understand the purpose of inspection, for improvement of processes and reduction of cost.* [Ref 1:pp 7-11]

Deming says "Routine 100 per cent inspection to improve quality is equivalent to planning for defects, acknowledgment that the process has not the capability required for the inspections." [Ref 2: p 28]

We must understand that inspection to improve the quality of a product is ineffective, costly and too late. Inspection does not improve the process; it only checks for defects. Defective products are removed and either discarded or remanufactured which increases the cost of the product. To improve the quality of products or services (i.e., recruit new soldiers, training our personnel, carry out maneuvers, etc.), we must improve each process to create an acceptable final product or service without inspection or rework.

Actions taken to change a process must be based on information and objective data. This may be done by collecting data on processes or outputs to construct a control chart. A control chart allows us to recognize special and common causes. Inspection is used then to improve the processes rather than to find end state defects. Information gained may be used to correct the process, thus reducing cost.

Two reasons to use a 100 per cent inspection are when the process is not in statistical control or when the process has an extremely high risk associated with it. In the first case, inspection is needed to prevent a poor quality product from reaching the customers and to collect the data to remove common causes. In the second case, the process may affect human life or a mistake may affect the image of a organization [Ref 2:p 261]. The purchase of parachutes is an example where 100 per cent inspection is justified. The logistic unit in charge of receiving the parachutes from the vendors must make a 100 per cent inspection to guarantee that the parachutes to be provided to airborne units are in perfect condition. There is no room for mistakes in this activity.

Point 4: End the practice of awarding business on the basis of price tag alone.

[Ref 1: pp 7-14]

In Argentina it is common to hear something like this: "If something is too cheap, it will be expensive in the end." It means that lowest price does not mean lowest total cost. Many times materials are bought because they are cheap, but usage proves them to be unreliable. More money is spent fixing countless problems due to initial money saving.

We no longer must select our supplier based on the price tag alone; we need to look for suppliers who share our same philosophy about quality. In other words, suppliers should be used that follow Deming's fourteen points in their own businesses.

Our buyers, the supply officer in the case of the Argentine Army, must not only know the characteristics of the products the vendors offer, but also what the final users think about these products, how the products perform in the organization, etc.

One way to improve the quality of the materials the Army buys is to reduce the number of suppliers. Important companies in the U.S.A, like General Motors, have [Ref 2: p 37] obtained excellent results by reducing the number of suppliers. A key factor is to establish a long term relationship between the organization and the selected suppliers. This allows the latter to invest in their companies and improve the quality of their products. Improvement in products means less variation in the products the Army buys, and even more important, less variation in the products the soldiers need (The term soldier includes any military person, from Enlisted to General.)

Point 5: Improve constantly and forever the system of production and service.

[Ref 1:pp 7-19]

The main idea of this point is to work constantly to reduce process variation, as well as to meet specifications. One good approach in reaching this goal is teamwork. Involving all the people who work in the design stage of any product or service, is the best way to save time, money and to produce a great product. Another approach is the Plan-Do-Check-Act (PDCA) Cycle that is discussed later in this chapter.

How does this idea fit in the Army scenario? Many times the "S3" (Operational Officer) works alone in his office, giving the best of himself to develop good plans for the unit. These plans sound outstanding. However when the unit tries to carry them out, problems surface. Operative equipment was found out of order. Either someone forgot to report the equipment problem or someone else forgot to record the information. Time would have been saved and efficiency improved if "that S3" had worked less isolated, for instance, within a team composed of the commander officers of the unit's companies.

Point 6: Institute training. [Ref 1:pp 7-22]

"The most basic and common feature of reengineered processes is the absence of an assembly line; that is, many formerly distinct jobs or tasks are integrated and compressed into one" [Ref 8:p 51]. This paragraph was introduced to illustrate that today a worker needs to have enough education and skills to complete more complex jobs than he/she used to do. An Officer or NCO must be prepared to carry out more complex tasks than before. The only way to accomplish this is through better training.

Deming argues: "Training must be totally reconstructed. Management needs training to learn about the company, from incoming material to the customers. A central problem is the need for appreciation of variation" [Ref 2:p 52]. The Argentine Army structure is familiar with this idea. During a career, an officer has worked as soldier and NCO before becoming an Officer with each rank moving him/her through different positions. This journey provides an Officer with a big picture about most of the interesting areas in the Army. One problem is, at least in the Argentine Army, that the officers leave "the blue cloth" too early, spending most of their careers doing paperwork. Another problem is that the word "Variation" is absolutely unknown within the Army environment.

Training must have or provide for some of the following characteristics:

- Everyone must know how to do their job.
- All personnel must receive process improvement education.
- It must be treated as an investment not an expense.

- It must help to create system thinking.
- It must be deeply understood that training is a never ending requirement.

Point 7: Teach and institute leadership. [Ref 1: pp 7-26]

Leadership refers to supervisory behavior, and the goal of leadership is to help people do a better job.

How can leaders do that? When leaders define TQL as a goal, and they allocate the resources (people, money, time, methods, etc.) to reach this goal they are helping their people do a better job. A leader's new job is coach and counsel, not a judge. The leader must also understand the processes they supervise [Ref 1:pp 7-26,27,28].

How can we move these ideas to the Argentine Army? Suppose a commander of a battalion is interested in introducing TQL in his/her unit. He/she must be willing to allocate his/her best officers, his/her time, and part of the scarce resources his/her unit has available to pursue the goal he/she has chosen for the unit. He/she also must understand and teach to his/her officers and NCOs what the new leadership style is, encouraging Officers, NCOs and soldiers to work closely with each other. He/she needs to create the image that any superior must be seen as somebody who is ready to help his/her personnel in any problem they face.

Finally, Officers and NCOs must know the processes they have to supervise. Nobody can help his/her people if he/she does not know the processes they are working in. As Deming says, "There is no substitute for knowledge" [Ref 2:p 50].

Point 8: Drive out fear. Create trust. Create a climate for innovation. [Ref 1: pp 7-30]

Fear in this context is related to the workplace. Kathleen D. Ryan and Daniel K. Oestreich define fear in the workplace "as feeling threatened by possible repercussions as a result of speaking up about work-related concerns" [Ref 5:p 21]. They also say:

Fear comes from different sources: actual experience in the current situation; stories about others' experiences; assumptions and private

interpretations of others' behaviors; negative, culturally based stereotypes about those with supervisory power [Ref 5:p 21].

Deming says, "No one can put in his best performance unless he feels secure" [Ref 2:p 59].

Fear blocks communication among people within the organization, meaning, fear does not allow ideas to flow. It has a very high cost in terms of personal frustration and money. A great idea can exist in the mind of someone and he/she prefers keep it in his mind because he/she is afraid of talking about it.

The Argentine Army has countless examples of a fearful environment. How many times has a commander's personality inhibited Officers' and NCOs' feelings of security? How many great ideas did someone have in a staff meeting that remained unvoiced?

There have been examples in the Argentine Army of leaders who exemplify driving out fear. Col Miguel Enrique Chichizola was one example. He was in charge of the 601 Communication Battalion with more than twenty-five Officers, twenty-five different personalities and everyone felt extremely comfortable working with him. Each time an Officer or NCO approached him with an idea, he listened and would say "Go ahead!" Sometime he improved the idea, sometime he preferred to keep the idea as it was, and even if he did not agree completely with it, he accepted other points of view.

Point 9: Optimize toward the aims and purposes of the company the efforts of teams, groups, staff areas. [Ref 1 :pp 7- 33]

All barriers which do not allow the organization to become optimized must be removed. Teamwork is an useful tool for this point.

Let's explain this point in the Argentine Army's context. All units have a staff. Usually for tactical units this staff is composed of: S1 (Personnel Officer), S2 (Intelligence Officer), S3 (Operational Officer), and S4 (Logistic Officer). Usually, all meet with the Commander and Second Commander of the units when plans must be developed. But the plans are eventually carried out by the companies. Therefore, the commanders of the companies must also be involved (as long it does not affect the secrecy of plans) in all stages of the planning process. Working in this way, if the

commanders of the companies realize that problems could occur during the execution phase of the plans, they have the opportunity to prevent them at an early stage.

Teams are very successful when their members function as a whole. This characteristic is called "alignment" [Ref 16:pp 234], and it occurs when the team's members have a shared vision and know how to complement one another's efforts. Leaders have the responsibility to create these aligned teams.

Point 10: *Eliminate exhortations for the workplace.* [Ref 1:pp 7-37]

Deming gives us examples of the kind of exhortations we have to avoid: "Your work is your self-portrait. Would you sign it?"; "Do it right the first time"; "Getting better together" [Ref 2:p 65/65].

How can a job be done right the first time if bad raw material, old equipment or poor processes are what is being working with? How can improvement be made if no one helps the workers when they have a problem or no one pays attention to their suggestions? As most of the problems come from the system, there is nothing a worker can do to solve those common causes. However under these kind of slogans, it appears they can. Solving common causes is the responsibility of the managers, not the workers.

Slogans are common in the Argentine Army. Almost all tactical units have one on their unit flag. All of these slogans push Officers, NCOs and Soldiers to do better. What they really need is a leader to work closely with them and to teach them how to do a better job.

Point 11: (a) *Eliminate numerical quotas for production. Instead, learn and institute methods for improvement.* (b) *Eliminate Management by objectives. Instead, learn the capabilities of processes, and how to improve them.* [Ref 1:pp 7-40]

Tactical units in the army carry out many activities when they take part in a military maneuver. Often, mistakes are made during the different stages of readiness. These mistakes usually result in increased time to accomplish a task. A wrong way to try to improve the unit's efficiency is to impart an order which says that the failed activity must be done in thirty minutes less time. The right way is to give to the units the needed

time to analyze the failed activity to find what the problems were. Then the next time the units accomplish this activity, they may save more than thirty minutes.

Point 12: *Remove barriers that rob people of pride of workmanship.* [Ref 1:pp 7-43]

People working with inadequate material, lack of appropriate training, following poorly written documentation become unhappy with what they are doing, even if they are doing their best. These are all examples of barriers to remove.

The annual rating of performance is another important barrier. Workers (Officers, NCO(s)) receive an annual rating, but this rating "reflects" their performance "within" the system they work in. We know that most of the problems in the systems are out of control of the workers. Therefore, this situation creates an undesired injustice. A collateral effect of rating people is that it destroys teamwork. Who is going to receive the award for a good idea? For this reason, in many private sector organizations, workers do not receive annual ratings.

Point 13: *Encourage education and self-improvement for everyone.* [Ref 1:pp 7-45]

Dr. Deming says:

What an organization needs is not just good people; it needs people that are improving with education.

In respect to self-improvement, it is wise for everyone to bear in mind that there is no shortage of good people. Shortage exists at the high levels of knowledge, and this is true in every field [Ref 2:p 86].

This statement should encourage Officers and NCOs to incorporate self-improvement, and leaders can play an important role in creating the necessary conditions which allow Officers and NCOs to dedicate time to education to gain new knowledge. However, as long as an Officer or NCO cannot satisfy their basic life conditions, it would be extremely difficult for them to allocate time to invest for the future. Solving this problem is the responsibility of the leaders.

Point 14: *Take action to accomplish the transformation* [Ref 1:pp 7-51]

Point 14 means taking action on the other 13 points. The transformation will neither happen overnight nor by issuing orders. It will require study, discussion, patience, perseverance and the contribution of everyone to reach the goal.

Top leaders must identify and incorporate senior and middle managers who seem to strongly believe in the transformation. This set of individuals become the beginning of the critical mass within the organization. In an organizational context, critical mass is: "The people within the organization who possess sufficient knowledge, power, and leadership to initiate and sustain a cultural change". [Ref 1:pp 2-51]. Creating the critical mass is an important element of the TQL transformation.

D. PLAN - DO - CHECK - ACT (PDCA) CYCLE

The third element of Deming's approach to quality is the Plan-Do-Check-Act (PDCA) Cycle. The PDCA is an adaptation of the scientific method applied to management planning and decision-making. Deming popularized the PDCA, but he credits Walter Shewhart with developing it [Ref 1:pp 5-16]. Each element is described below.

1. Plan Phase

The first step in this phase is to select what process needs to be improved. To make this decision, the process must meet criteria such as:

- Addressing customers concerns.
- Having an significant impact in the organization.
- A process that will become successful with improvements.
- The organization has control over the process.

The second step is to identify which proposed changes will improve the process. In other words, we need to figure out a tentative hypothesis which explains a relationship

between observed events. Probably, many different hypotheses will be found, but knowledge of the process should help to select which hypothesis to test first.

The third step is to select what data must be gathered to find if the process has improved or not.

Finally, a data collection plan is needed. This plan must define: how, when, and by whom data will be collected.

The Plan Phase, "is the key to everything that follows in the PDCA. A poor plan can lead to inappropriate and inefficient use of resources, as well as to inconclusive or inaccurate results" [Ref 1:pp 5-21].

2. Do Phase

The Do phase consists of making some changes, initially on a **small scale**. The effect of these changes are measured over time (as specified in the data collection plan), so they can be compared with measures taken before the changes [Ref 1:pp 5-22].

We can summarize this phase in three steps:

- Gather baseline data.
- Make planned changes (**on small scale**).
- Gather data to determine what happened after the changes.

3. Check Phase

During this phase, data collected after the change was implemented is compared with the baseline data to test the hypothesis formed during the Plan Phase [Ref 1:pp 5-24].

Two major activities may be recognized in this phase:

Determine whether changes led to improvements. Managers must understand what the data "say": Has the process improved? Only the data has the answer. Tools like Run Charts or Pareto Charts will help in this phase.

The second major activity is to compare results of changes with what was planned. Did the results support the hypothesis? If yes, can we generalize this finding? Is the

solution feasible (technically, economically)? If not, what is wrong? Is the hypothesis wrong? Were the data wrong?

Managers, again, have the responsibility to verify that the data are accurate and interpreted correctly.

4. Act Phase

The purpose for collecting data is to be able to make decisions and take action. Whatever decision is made must be based on credible data. [Ref 1:pp 5-26]

The main activities at this step:

- Determine which changes should be implemented. The managers face two possible situations: to implement the tested hypothesis in the whole organization, or to revise the hypothesis and do more testing.
- Institutionalize the changes. If the hypothesis is shown to be a success, a **formal** change must be made in the process.
- Educate and retrain the workforce in preparation for change.
- Assess the potential application of this change to other parts of the organization. Determine whether further changes may be made without more testing.
- Monitor the process. Managers must monitor the implemented change and the results of the change. The process should not be allowed to return to its original format during this period.
- The final step of this phase is to go to the Plan Phase and restart the cycle, honoring Dr. Deming's concept: "improve constantly and forever the system of production and service, to improve quality and productivity and thus constantly decrease cost" [Ref 2:p 23].

E. THE DEADLY DISEASES

Thus far the reader has been introduced to a new philosophy, which can lead to an improved Argentine Army, but this philosophy is not threat free. The intention of this section is to inform the reader about some systematic threats which may impede a successful TQL implementation.

1. Lack of constancy of purpose to plan product or service that will have a market and keep the company in business and provide jobs. [Ref 2:p 97]

Probably some of these words, such as "product," "service," and "market" sound strange to military ears, but these words are deeply related within the daily activities of the military.

The Argentine Army proves a service (national security) to a market (Argentinean citizen). For many years, the AA has defined the type of services the AA would provide to the market. In addition, the top military leaders of the Argentine Army were never assigned to their position for long. Often, both of these characteristics led the Army to allocate resources to projects which never went beyond paper plans, or were not in the best interests for our citizens. If the Argentine Army was a private company, it would probably no longer be in business. As a matter of fact, a sector of Argentinean citizens have voiced their concerns to the Parliament to suppress the Argentinean Armed Forces.

The Argentine Army, as with any other organization, must avoid this disease if it wants to survive.

2. Emphasis on short-term profits. [Ref 2:p 99]

In the AA environment, profit is a sign of both money and prestige. For an officer, the best time to make profit is when he/she is in charge of a military unit (usually no more of two years). It has created a folklore in the AA. For instance, it is common to hear, "You have to accomplish something before leaving your command." This type of thought should be changed to, "You must make improvements in your command which look for long-lasting results" or "What would my relief want me to do?". If this idea is understood, more long term projects may be developed for the future.

3. Evaluation of performance, merit rating, or annual review. [Ref 2:p 101]

This disease is critical, to understand and to solve. Dr. Deming says: "It (annual performance rating) nourishes short-term performance, annihilates long-term planning, builds fear, demolishes team-work, nourishes rivalry and politics" [Ref 2:p 102].

Dr. Deming continues:

The idea of a merit rating is alluring. The sound of the words captivates the imagination: pay for what you get; get what you pay for; motivate people to their best, for their own good. The effect is exactly the opposite of what the words promise. Everyone propels himself forward, or tries to, for his own good, on his own life preserver. The organization is the loser. [Ref 2:p 102]

The main idea in eliminating this disease is to move from a competitive environment to a cooperative environment [Ref 3:p 126]. A cooperative team environment is difficult to create when each member knows an individual rating will be given. It is also difficult for a large organization, like the Army, to eliminate its rating system. Dr. Deming suggests some principles which can build a new style of leadership that may help to solve this problem:

- Institute education in leadership obligations, principles, and methods.
- Carefully select the right people in the first place.
- Allow for better training and education.
- Leaders may be colleagues rather than judges.
- A leader must help those with problems to give them the opportunity of creating pride in their jobs.
- A group that forms a system will be awarded as a whole.
- Hold long interviews with each employee periodically to promote suggestions and better understanding throughout the organization.
- Performance data should be used to improve the system [Ref 2:p 117]

I believe this disease requires further research to decide on an implementation plan for organizations like the Argentine Army.

4. Mobility of Management. [Ref 2:p 120]

Although this disease is fairly self explanatory, its consequences are important to understand, because this disease among other things, annihilates teamwork. Once a manager (in our case an Officer or NCO) leaves an organization, he/she leaves the team he used to work with. Each time a new manager comes in, the team needs to rebuild its culture (rules, beliefs, behavior, etc.). It is thus extremely difficult for a team to become effective and efficient for a long period of time.

The mobility of the Commander Officer (CO) also has a tremendous influence on the working atmosphere [Ref 11:p 6], affecting, among other things, how teams work because a new CO may impose team rules rather than allowing the teams to set their own rules.

5. Running the company on visible figures alone (counting the money). [Ref 2:p 121]

Although this concept comes from the business world, it may be used in the military world as well. The business world reality relates this idea to money and wealth. Others factors are as important as money, for instance, customer satisfaction. A happy customer will return and he/she will probably tell others, creating more and therefore new income.

The AA will not have much trouble combating this disease due to the Argentine culture. Argentine society does not even give money first priority. Intangible values usually have priority over money. What the AA may need to improve is a system to value intangible needs, for instance, customer satisfaction.

F. DON APPROACH TO TQL

The Department of the Navy's (DON) approach to Total Quality evolved since the early 1980's at aviation depots and naval shipyards. However, on February 10, 1992, the DON issued a formal commitment to this new philosophy by issuing its Vision, Guiding Principles and Strategic Goals [Ref 7].

The DON says, "...The support establishment consists of: Leaders prepared to exercise their responsibilities with quality as the principal focus..." [Ref 7: p A-2].

In its guiding principles DON says:

...We recognize the central fact that our Sailors and Marines are the best prepared and that our units have the highest rate of operational readiness in our history. They are at the heart of our ability to perform the mission. We must maintain that quality.

We are all responsible for accomplishing the mission. That is our first loyalty. We must strive to find new ways to cooperate within the DON which look beyond a single service warfare community or traditional role and responsibility. Pride, professionalism and a sense of community are extremely important but we must ensure that they are not rigid barriers to our interoperability. The valuable process of competing for resources and roles must not be carried to divisive and destructive extremes....[Ref 7:p A-3].

The DON has introduced a clear direction toward "system optimization" in its guiding principles.

The Strategic Goals established by the DON are in the areas of Integration; Human Resources, Education, Training; Acquisition; Innovation and Technology; and Facilities [Ref 7:p A-4]. Although an explanation of these goals would be interesting, for the scope of this thesis, the area of Human Resources, Education, Training will be addressed. These areas show, in remarkable form, how TQL philosophy is built-in at the strategic level.

...Continuously improve the quality of our military and civilian work force through fact-based, innovative systematic changes affecting recruitment, training, and quality of life.

Especially, the DON will:

- Identify and remove the barriers to equal opportunity for all our people.
- Improve the military recruiting system through better requirements determination, resources allocation, and day-to-day operations.

- Improve determination of military training requirements, feedback system, delivery of training to meet fleet requirements and foster student success; properly fund training and eliminate redundancies in the system.
- Improve the civilian recruiting and hiring system through better requirements determination and resources allocation.
- Improve civilian training by improving requirements determination, training delivery, and by adjusting resources to match requirements.
- Enhance the working environment to improve the performance of quality military and civilian personnel" [Ref 7:pp A-4/A-5].

1. DON as a Traditional Organization

A major barrier to creating a TQL transformation in the DON was the traditional DON structure is hierarchical with vertical links through the chain of command. This kind of structure which has proved to be the most effective way to ensure top-down communication, which is vital in crisis time or combat. This structure, however, generates many problems for a successfully TQL transformation.

One of the largest deficiencies is that *it does not tell how the organization works, how is quality guaranteed and how optimization problems are solved.*

A traditional organizational structure has characteristics such as:

a. Institutionalizes Top-Down Communication

In theory, this structure should provide an appropriate way to communicate information from the bottom up. However, this is not what generally happens. The problem is that each hierarchical layer serves as a filter [Ref 1:pp 2-30]. Suppose an organization has six hierarchy levels and a "great idea" is generated at the bottom of the organization. If this idea is shared with four people, it is only necessary for one person to say "NO" and the idea is gone, regardless of which level the disapprover is located.

b. Impedes the Aim of the System When Organized by Function

The main problem here is that each department functions like a separate entity, and it tries to preserve its own life. [Ref 1:pp 2-30] An example from the business world shows some important consequences of this type of structure:

A plane belonging to a major American airline was grounded one afternoon for repairs at Airport A, but the nearest mechanic qualified to perform the repairs worked at Airport B. The managers at Airport B refused to send the mechanic to Airport A that afternoon, because after completing the repairs the mechanic would have had to stay overnight at a hotel, and the hotel bill would come out of B's budget. So, the mechanic was dispatched to Airport A early the following morning, which enabled him to fix the plane and return home the same day. A multi-million dollar aircraft sat idle, and the airline lost hundreds of thousands of dollars in revenue, but Manager B's budget was not hit for a \$100 hotel bill. Manager B was neither foolish nor careless. He was doing exactly what he was supposed to be doing: controlling and minimizing his expenses [Ref 8:p 8/9]. The moral is that often the efficiency of a company's part comes at the expense of the efficiency of its whole.

c. Reduces Sense of Ownership

When work is functionally organized and managed by departments, it is difficult for employees to see their individual contribution to the whole product or service [Ref 1:pp 2-31].

d. Encourages "We-They" Thinking

The traditional organizational structure separates the workers, physically and organizationally. Due to lack of communication, the suppliers do not know the needs of their customers. The "we-they" thinking finds an appropriate field in which to grow, creating hostilities between departments and pointing blame for bad products [Ref 1:pp 2-30].

e. Increases Cost of Supervision

The traditional organizational structure follows a model discovered by Adam Smith two hundred years ago, which suggests that work should be broken down into its simplest and most basic task [Ref 8:p 2]. The assumption was that workers could not understand the whole process because of lack of knowledge [Ref 1:pp 2-32]. A supervisor was the solution: somebody who controls all the workers. This person, rather than thinking about how to improve the process, spent his time walking around observing the process and fixing problems.

f. Reduces Flexibility to Respond

Bureaucratic structures are highly rigid. They are usually based on functional division rather than processes. This division creates barriers which are difficult to overcome by anyone who attempts to work across the processes [Ref 1:pp 2-32].

2. A New Concept of Organization

We need to move from the traditional structure to another which allows barriers to be eliminated, and encourages departments to work together in cross-functional teams toward common goals. Parallel learning structures have proven to be an excellent approach when creating a microcosm of the complete organization in order to provide the needed flow of information from all levels and parts of the organization [Ref 9:p 32]. This concept was also understood by DON, which defined a parallel learning structure to allow:

- maintaining the chain of command.
- focusing the organization on processes.
- linking the organization horizontally and vertically for communication and decision making [Ref 1:pp 2-32]. This structure will be discussed in the following section.

3. Implementing TQL in DON

The top leaders at DON honored their commitment to quality improvement by allocating the needed resources to carry out four critical and essential stages that support TQL implementation in the Navy. These stages are:

- Educating Senior leaders.
- Building a Critical Mass.
- Creating a Cross-functional Team Structure.
- Creating a Strategic Focus. [Ref 17: p 43]

a. Educating Senior Leaders

The Commanding Officer and the Executive Officer have the obligation for leading the TQL implementation. They must understand their responsibilities. This education has been provided through a Senior Leaders' course. In this course, the Senior Officers learn about: what TQL is, Deming's theory, creating critical mass, starting process improvement, and leading the TQL transformation.

b. Building Critical Mass

Although top leaders put forth their best efforts, change to a total quality approach cannot be accomplished by them alone. They need other people to share this new philosophy. These people should belong to different levels of the organization, and possess sufficient knowledge, power, and leadership to initiate and sustain a cultural change. A group of these people are what Deming calls "Critical Mass" [Ref 1:pp 2-51].

"The critical mass is the catalyst required to begin the change" [Ref 14: pp 2-19]. The vision of the leaders, along with the people who have knowledge and power, will sustain the movement toward quality in an organization.

A general education and training strategy was developed by DON to build the critical mass. This strategy was composed of three major components: deploy "Introduction to TQL" to meet the DON surge; a comprehensive curricula contained in a series of related courses which were used to train the critical mass; integration of TQL

concepts and methods into training for DON personnel (military and civilian) [Ref 20: p 16]. In 1991 pilot projects were undertaken under this strategy to start building a critical mass in the fleet. Twenty military personnel from different navy communities were trained to serve as consultants to 11 operational units, called "demonstration units" to initiate process improvement efforts [Ref 11: p V].

c. Creating Cross Functional Teams

The DON has created three types of cross-functional teams to solve the problems traditional organization structures present and as necessary tools for the introduction of TQL in the Navy. These teams are:

- Executive Steering Committee (ESC).
- Quality Management Boards (QMBs).
- Process Action Teams (PATs).

As Figure 3-9 illustrates, these three teams have specific up and down communication links which ensure a two-way flow of communication. This provides a method for identifying and eliminating or reducing the effect of special and common causes of variation and preserves the chain of command [Ref 1:pp 2-43].

(1) Executive Steering Committee (ESC). The members of this team are the organization's top leadership. The ESC membership normally includes the CO, XO, department heads and the command master chief. The Argentine Army ESC membership could be composed of: the commandant of the unit, the staff and the companies' chiefs. The ESC's primary responsibility is to set the stage for the TQL transformation [Ref 1:pp 2-35].

Other responsibilities include:

- Developing and adopting a quality leadership philosophy. This philosophy will be a landmark for the new leadership style. It must include a vision statement showing where the organization wishes to be in the future [Ref 1:pp 2- 35]. See Section F.2.d. for discussion of DONs efforts in this area.

- Based on the new quality philosophy, develop and deploy a TQL strategic plan that includes strategic mission-related goals of the system. DON efforts discussed earlier in Section F.
- Identify external customers and understand what the customers wants (today and in the future).
- Identify (at least at a macro level) and give to the processes the appropriate priority to define the order in which they must be improved.
- Once a strategically important process for improvement has been identified, the ESC, by creating a macro-level flow chart of the process, can identify all the middle managers related to it and identify who becomes the process owners (those individuals who have under their control, the most important steps of the process). Process owners, coming from the different areas related with the process will form the QMB.
- Provide resources and decision support. [Ref 1:pp 2-37]

(2) Quality Management Board (QMB). A QMB is a cross-functional team composed of managers who are jointly responsible for a process that produces a product or service. The members of a QMB in the AA may be a chief of a company and his chief of sections, as well as seniority NCOs. For example, in a Communication Battalion of the Argentine Army, the installation, operation and maintenance of a Communication Center is a key process. This process requires the participation of all Battalion's Companies given that many activities need to be coordinated. This is an appropriate situation to use a QMB composed of the chief of the companies, their chief of sections and their senior NCOs.

In theory, one QMB should be responsible for one process, but if the process becomes too large, hierarchical QMBs may be created, with a higher-level QMB overseeing the coordination of the others [Ref 1:pp 2-38].

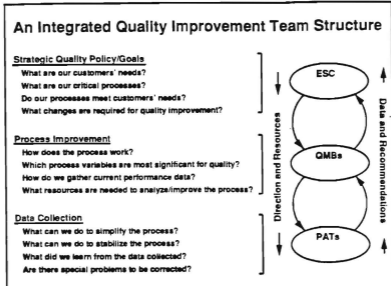


Figure 3-9. An Integrated Quality Improvement Team [Ref 14: pp 2-43].

The QMB responsibilities are:

- Developing a plan for process improvement. Two major tasks must take place. The first one is to identify and create a macro-level flowchart; the second is to translate the quality characteristics identified by the ESC and the customer into measurable characteristics.
- Initiating a process analysis. The QMB starts collecting data that may be used to determine the effectiveness of process changes.
- Chartering Process Action Teams (PAT). The QMB may charter these teams to aid in data collection and analysis in a subprocess area. More than one PAT may be chartered if the QMB needs data in more than one area.

- Providing resources and decision support to the PAT in the same way the ESC does with the QMB.
- Evaluating effects of process changes and recommending major process changes to the ESC. [Ref 1:pp 2-38]

(3) Process Action Team (PAT). A PAT is composed of the subordinates who are most directly involved in a process that is under the span of control of one supervisor or manager [Ref 1:p 2-41]. A PAT is not considered a cross-functional team. Usually, PATs are teams created to satisfy short term requirements, such as, to remove special causes of variation in a process.

In the Army, a PAT may be composed of the chief of sections, the section's NCOs and the soldiers. Some of the PAT responsibilities are:

- Developing measures to check whether the quality characteristics of the customers have been met.
- Collecting data.
- Identifying and removing special causes of variation. Given that the PAT's members work within the process, they know the process in detail. This makes it easy for them to spot and remove special cause variation. It is important to keep in mind whether the solution provided by the PAT affects other stages of the process; otherwise, suboptimization of the process may occur.
- Making recommendations to QMB for reducing common causes of variation.
- Documents process analysis and action on special causes. This will allow PAT members to transmit their experiences related to the solution of special causes variation. [Ref 1:pp 2-43]

(4) Downward and Upper Links. These links handle the vertical integration of the three structures. Each link has its own duties and each link is carried out by different people.

The Downward Link is a member of ESC when linking down to a QMB, or is a member of QMB when linking down to a lower-level QMB or a PAT [Ref 1:pp 2-43].

The main roles of the downward link are:

- Courier of the charter. As a representative of higher management, the downward link brings the charter to the subordinate QMB or PAT team leader. It is important to keep in mind that "the downward link attends all QMB or PAT meetings, but does NOT serve AS team leader".
- Interpreter of limits of responsibility. While the charter for the effort should clearly identify the scope, time, and resources to be applied, some situations may arise that require the downward link to interpret the limits of responsibility for the subordinate team. [Ref 1:pp 2-44]
- Messenger of common causes. Lower level teams work in specific parts of the process. This narrow but necessary vision at their level may make it difficult for them to recognize common causes. The downward link must work to avoid this problem.
- Provider of resources. The primary resource that the downward link must provide is his/her personal time.
- Identifier and remover of impediments. Unnecessary bureaucratic requirements and ineffective tools must be removed as soon as possible to avoid frustrating team members. This does not mean the downward link must satisfy all team members' requests, only the requests which are impeding team work [Ref 1:pp 2-44].

The Upward link. One of the roles of the PAT or QMB team leader is to serve as the upward link to the next higher level team. The upward link has the responsibility to provide all information to the higher level team [Ref 1:pp 2-46].

(5) TQL Supporting Roles. The organization implementing total quality will need other people to support the TQL implementation. These people and their roles are detailed as follows:

- **TQL leader.** This is usually the commanding officer or officer in charge. He/she is responsible for TQL implementation as well as strategic improvement in the organization. He/she accomplishes this by establishing the critical mass, leading efforts to formulate a strategic plan and evaluating progress on strategic improvement efforts. The TQL leader normally serves as the chair of the ESC.
- **TQL coordinator.** He/she reports directly to the organization's leader and manages a TQL support office. The coordinator has responsibilities for technical support, training, documentation, and provides and maintains a library of TQL related material.
- **Quality Advisors.** Quality advisors assess team training needs and provide training as necessary. They also help teams by providing technical guidance for data collection and interpretation. If required, they work with the team leaders to facilitate team functioning until the teams are functioning smoothly.
- **Statistician.** Initially, the organization will not need a statistician, but a statistician may be necessary after the process has been stabilized (no special causes) to carry out experiments for further improvement [Ref 1:pp 2-49].

d. Creating Strategic Focus

To implement TQL in the Navy, the Navy Personnel Research and Development Center (NPRDC) has developed a two phase approach:

- **Phase I.** The goal of this stage is to create the critical mass. This may be done through education and planning. The DON education strategy was covered in the previous discussion of critical mass. The planning phase ought to highlight continuous improvement, customer oriented requirements, decision making based on objective data, evaluation of outputs in terms of customer requirements and future needs. Pilot projects may be set up to assist top leaders in integrating the new knowledge. Information on DON TQL pilot projects is provided in the next subsection.
- **Phase II.** This phase addresses long term issues. During Phase II, activities result in innovation and design of new systems or processes aimed at the most strategic plans for the future. A key factor for success in implementing TQL is that leaders adopt a management style which focuses on satisfaction of the external customer needs by defining and improving critical processes.

4. Lessons Learned From TQL Implementation in the Fleet

The findings and lessons learned from USN fleet TQL applications [Ref 11] is a document well worth reading although only three findings and a few lessons are described.

a. Findings [Ref 11:p 3/4]

The Leadership style of the CO and the culture of the organization have a great impact on successful initiation of TQL practices. The leadership style and involvement of the top leader affect the organization's readiness for change and its continuing progress. The culture of the unit affects the attention and commitment that everyone gives to the TQL effort, the way people interact in teams, and the degree to which system optimization is achieved and the overall performance improved [Ref 11:p 3]. Determining the readiness of AA senior leadership for TQL is a major function of this thesis.

There are no essential differences between operational units and shore support commands with regard to requirements for TQL education, training, and implementation. The TQL training content is the same for both Fleet and shore commands with regard to the message, the courses delivered, the target audiences, and TQL support roles. TQL implementation is the same with regard to the way supervisors relate to subordinates, the way decisions are made, the way quality is defined, and the way work processes are analyzed and improved. [Ref 11:p 4]

There are differences between operational units and shore support commands with regard to the conduct of TQL education, training, and implementation. The conduct of TQL training is different in the Fleet because of deployment schedules and aspects of life unique to operational settings. [Ref 11: p 4]

This finding does not have the same weight in the Argentine Army due to the lack of a deployment similar to the USN, but if the present trend of overseas missions continues in the Argentine Army, it may become a constraint.

b. Lessons Learned [Ref 11 - Part I]

(1) How does the leadership style of the top leader affect TQL training and implementation?

- An organization's readiness for changes is CO dependent.
- Continued progress in TQL is dependent on the commitment of the new CO. (This refers to personnel rotation issues. Deming's mobility of management disease.)
- Positive feedback from the CO and ESC reinforces a unit's commitment to TQL.
- The atmosphere set by the CO influences team functioning.
- Receptivity to change generally increases as the work experience of the CO increases.

(2) What is the influence of the Navy culture on TQL training and implementation?

- Top leaders must understand that change is neither quick nor easy.
- People are reluctant to try new things because they are afraid of making mistakes.
- Reduction of fear is necessary to create a climate of trust and cooperation where system optimization can occur.
- Units need to understand the influence of the Navy culture for change before starting process improvement.
- Operational pressures affect the focus that Fleet units bring to TQL training and implementation.
- Military job rotation has a negative effect on productivity and maintaining constancy of purpose.
- Ranking of personnel undermines cooperation and team effort.
- The "use or lose" practice of managing resources encourages wastefulness.

(3) What is the influence of TQL on the Navy culture?

- Working in teams is not new in the Navy; what is new is how the teams interact.
- TQL shifts negative attention from the individual to the system.
- Documenting the steps of the process can help new people new begin to work efficiently and effectively.

(4) What are the requirements for TQL education and training and how are TQL, education and training conducted in the Fleet?

- When initial training is spread out over too long a period, learning is compromised.
- TQL theory can be taught in large groups, a savings of time and money.
- Team building skill training should be conducted with people who will work together.
- TQL education and training may be laid out in different ways to meet operational schedules.
- Training opportunities vary from platform to platform.
- Both military and generic TQL examples have value.
- The ESC should address training of new team members as well as refresher training.

(5) What are the requirements for TQL implementation and how is implementation conducted in the Fleet?

- Selection of an appropriate TQL coordinator is critical to an organization's progress.
- ESC must set boundaries for QMBs; QMBs must set boundaries for PATs.
- Charters help teams in planning and conducting process improvement.

- The ESC may need to prioritize goals.
- Early implementation efforts should focus on process improvement rather than strategic planning.
- Documented improvement are more likely to be sustained as team membership changes.
- Ideas for initial process improvement efforts may come from all levels of an organization.
- The same person should not serve as the upward and downward link because of a possible filtering of information.
- Team structure and membership should be tailored to the size and complexity of a command.
- Because of time constraints, team meetings need to be well planned and executed.
- Process improvement teams should consider inviting the customers to participate in team meetings.
- Facilitation skills may always be needed because of changes in team membership and the military rotation policy.
- ESC's should be alert to the impact of process improvements on the organization to avoid suboptimization.

These lessons learned by U.S. Navy should be taken into account by the Argentine Army if it decides to undertake a TQL transformation.

IV. SURVEY ANALYSIS

This chapter presents an analysis of the survey conducted of the Argentine Army Headquarters in relation to Deming's fourteen points. An analysis of Deming's fourteen points is related to the survey results with a general interpretation of the results as they apply to the Argentine Army.

It is relevant to note that the final outcome of this analysis is to provide a feeling for how open the Argentine Army top leaders are to the introduction of TQL principles.

A. SURVEY RESULTS

The tables presented below summarize the results of the survey information. The framework for analysis of the survey results will be Dr. W. Edwards Deming's Fourteen Points. Most of the points have been correlated with one or more survey question as indicated in Figure 4-1.

Deming's Point	Question #	Deming's Point	Question #
1	4,8	8	13
2	6	9	3,5,9
3	7	10	None
4	12	11	1
5	8,9	12	2,3,10,11,14
6	8,9	13	8
7	8	14	None

Figure 4-1. Deming's Points as it relates to survey questions.

Table 4-1 summarizes the results of questions 1-3, 5-7, and 10-13 which are based upon a Likert response scale. The mean, standard deviation and frequency distributions are provided.

Table 4-1. Summary of results of Questions 1-3, 5-7, and 10-13.

Q #	Question	SD (0)	D (1)	U (2)	A (3)	SA (4)	\bar{x}	σ
1	Do you think the Annual personal Evaluation requires Officers and NCOs to focus on short results in order to show that something has been accomplish each year?	1	3		2		1.5	1.2
2	Do you think the Annual Personal Evaluation affects long-run projects?. Such as changes of people's behavior which can not be seen in less than 2 o 3 years.	1	3		2		1.5	1.2
3	What do you think of replacing the Annual Personal Evaluation by a Biennial Team Evaluation ? (i.e.: a qualification for the company as a whole, for the section)	2	3		1		1	1.1
5	Do you see cross-functional teams as a tool to solve specific problems in the organization you are in charge of? NOTE: Cross-functional teams are those teams composed by persons coming from different functions within the organization.				4	2	3.3	.5
6	Do you see it is necessary to rethink how your organization is doing business?				3	3	3.5	.5
7	What do you think about making inspections using a sampling of parts of your organization rather than mass inspections?		3		3		2.0	1.1

Q #	Question	SD (0)	D (1)	U (2)	A (3)	SA (4)	\bar{x}	σ
10	Do you think that your organization has a good flow of communication among different hierarchic levels such that new ideas are allowed to arise easily from the lower levels up to your level?	1			4	1	2.7	1.4
11	Do you think it would increase your organization's performance to empower the lower levels in the chain of command to make more decisions ?				2	4	3.7	.5
12	Do you think that your organization should select its suppliers by the quality of their products rather than by the price tag of them?				2	4	3.7	.5
13	Do you think it is necessary to eliminate from your organization anyone feeling threatened by possible repercussions as a result of speaking up about work-related concerns?	1		1	4		2.3	1.2

Legend:

SD = strongly disagree

D = disagree

U = undecided

A = agree

SA = strongly agree

() = numerical value of choice

Table 4-2 provides the results for question eight of the survey. Each respondent divided 100 points among a number of options related to various of Deming's Fourteen Points. For each option, the table indicates the number of points allocated by each respondent plus a percent of total points allocated, and based on that, a final ranking. This question was designed to address the relative importance of TQL-related efforts with other areas of organizational focus. Each option will be discussed under the point it is correlated with.

Question Eight: You have 100 points. Please allocate them to the options below to reflect their relative importance for your organization. Please make sure you allocate 100 points.								
Option	R1	R2	R3	R4	R5	R6	Avg. # Points Allocated	Final Ranking
Acquisition of new material	20	5		5		5	5.83	8
Education	10	15	20	25	40	40	25.0	1
Down sizing	5	5		5	10	5	5.00	9
Training	20	10	20	20	30	10	18.33	2
Leadership	5	25	30	5	10	10	14.17	3
Projecting a good image	5	5	20	10		4	7.33	6
A strategic plan for improvement	5	20		10		10	7.5	5
Continuous improvement of processes	10	10		10		10	6.67	7
Identify and satisfy those who receive our job	20	5	10	10	10	6	10.17	4

Legend:

R1 to R6: Each column identifies a different respondent.

Table 4-2. Results for survey question 8.

Table 4-3 indicates the results for question nine which is designed to validate the responses to question eight. However, instead of an organizational emphasis, this question focuses on the allocation of individuals' time to various TQL and non-TQL-related activities. Each respondent's choices are displayed along with the total percentage of hours allocated for each option.

Question Nine: You are in a position to distribute the eight hours of daily working time of the people working for you. How would you allocate these hours among the different options? Please make sure you allocate 8 hours. Assume peace time.								
Concept	R1	R2	R3	R4	R5	R6	% Hours Allocated	Final Rating
Administrative Tasks	1	1		4.5	1	1.5	18.75	3
Learning something new	1	.5		.5	1	.75	7.81	6
Improving personal skills	1	1		1		.75	7.81	5
Improving team skills	1	3	4	.5	2	1.5	25.00	1
Improving process	2	.5	4	.5	2	2.75	24.48	2
Talking with people they support	2	2		1	2	.75	16.15	4

Legend:

R1 to R6: Each column identifies a different respondent.

Table 4-3. Results for survey question number 9.

The data for questions 4 and 14 will be presented and discussed in the survey analysis section.

B. SURVEY ANALYSIS

1. Point one: Create constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs. [Ref 2:p 23]

It appears this point has a high degree of support at Argentine Army Headquarters. Part of creating constancy of purpose is to have a long term focus for the future of the organization. Question four (Table 4-4) shows that five generals (83.3%) prefer to

undertake middle-run (1-3 year) plans and one general prefers long-run (more than 3 years) planning. None believe in a short-run (less than one year) focus.

Question Four: What kind of plan do you prefer undertaking in your organization?		
Short-Run Plan (< 1 year)	Middle-Run plan (1 - 3 years)	Long-Run Plan (>3 years)
	5	1

Table 4-4. Analysis of survey question number 4.

Although this trend is not an ideal situation for creating the constancy of purpose required by this point, if one notes that Argentina is coming out of a period of fifty years of extremely fluctuating and high inflation rates and many military coups, it is easy to realize why it is difficult for top leaders to have longer than a middle-run focus. Later in the survey (Question 8, See Table 4-2), when asked to rate the relative importance of a strategic plan for improvement against eight other aspects of organizational life, the strategic plan received an average of 7.5 points out of a possible 100 and only ranked number 5 out of 9. In fact, two of the six respondents did not allocate any points to the strategic plan option. So, although senior leaders prefer to plan for the middle run, they do not see strategic planning for improvement as being of critical importance. A possible explanation is that strategic planning is generally associated with long-run planning. This position may also affect the recognition of TQL as a strategic issue.

2. Point Two: Learn the new philosophy. Top management and everybody.

[Ref 1:pp 7- 8]

Question 6 (Table 4-1) relates to this point. All respondents either agreed or strongly agreed that it was necessary to rethink how their organization was doing

business. This indicates a readiness/willingness to look for new ways of doing business. This belief is a precursor for "learning the new philosophy" of quality management.

3. Point Three: Understand the purpose of inspection, for improvement of processes and reduction of cost. [Ref 1:pp 7-11]

Survey results do not allow us to conclude that there is support for this point. Question 7 (Table 4-1) indicates a bimodal distribution with 3 generals agreeing that sampling for inspection would be useful and three disagreeing. These results may be explained by the different degrees of trust each general has regarding his subordinates. Trust is required to change the culture of an organization. If trust is not present, the cultural change required for a TQL program may not be present.

4. Point Four: End the practice of awarding business on the basis of price tag alone. [Ref 1:pp 7-14]

There was overwhelming agreement with this point by all six generals (See Table 4-1, question 12). The generals clearly refuse to select the suppliers of their organizations on basis of price tag alone, and they also recognize the importance of awarding vendors by the quality of their products or services. These values correspond exactly to Dr. Deming's premise.

5. Point Five: Improve constantly and forever the system of production and service. [Ref 1:pp 7-19]

Portions of question eight (Table 4-2) and nine (Table 4-3) are related to this point. In question eight, the option "continuous improvement of the process" had an average score of 6.67 out of a possible 100 points and was ranked seventh out of nine as to its relative importance to other organizational options. This indicates that the generals surveyed did not see process improvement as important organizationally as education, training, leadership, satisfying customers, a strategic plan for improvement or projecting a good image. However, it can be argued that for continuous process improvement to

happen, many of these more highly ranked options need to also occur. The results of question nine (Table 4-3) indicate that most of the respondents do think process improvement is an important part of daily work life for their subordinates. On the average they would ideally allocate 24.48% of their subordinates normal workday to improving processes, second only to improving team skills. Only two respondents would allocate less than 1/4 of the work day to improving processes. This implies that although the generals surveyed ranked process improvement fairly low from an organization-wide perspective, it is thought to be an important part of daily work life. Possibly the lack of a systemic vision has generated this contradiction. They may not see each individual task as part of a whole system and that the whole system affects each task.

6. Point Six: Institute training. [Ref 1:pp 7-22]

This point has high support at the AA Headquarters. Training was ranked second only to education in question 8, reflecting the priority given by the generals to this TQL related concept. Question 9 (Table 4-3) shows that the Generals are willing to allocate almost 40% of their personnel's work time toward training related activities (learning something new [7.81%], improving personal skills [7.81%], improving team skills [25%]). If a formal plan would require time resources to be allocated to specific training activities, the senior leaders support for undertaking this plan would be highly probable. This finding is very important because TQL is a discipline demanding training and education.

7. Point Seven: Teach and institute leadership. [Ref 1:pp 7-26]

Leadership is recognized as an important concept by AA top leaders. Question 8 (Table 4-2) shows leadership ranked number 3 out of 9 other TQL-related and organizational concepts, just behind education and training (also TQL-related). The position given to leadership in this question is relevant because it shows the potential support for activities aimed toward teaching and instituting leadership.

8. Point Eight: Drive out fear. Create trust. Create a climate for innovation.

[Ref 1: p 7-30]

Question 13 (Table 4-1) shows that four generals agree with this point, one general is undecided and one general strongly disagrees with this idea. An explanation to the answers of the two last generals is difficult to ascertain. Possible these two generals were either strongly influenced by the times when the Armed Forces were in charge of the National Government (the last military government lasted from 1976 to 1983) or they do not completely understand the perverse effects that fear generates in the workplace [Ref 5]. These two generals, although a minority, represent 33.33% of the sample, which may represent the same proportion of senior leaders. Further survey investigation of a larger sample of AA leadership should be completed to ascertain valid response to this question. If the same percentage becomes apparent, a barrier may exist in the AA toward the adoption of TQL.

9. Point Nine: Optimize toward the aims and purposes of the company the efforts of teams, groups, staff areas. [Ref :pp 7- 33]

A high degree of support was found for this point although disease has been found underneath.

There are three questions related to this concept: questions 3, 5 and 9. Question 3 (Table 4-1) shows that most of the generals (5 out of 6) either do not agree or strongly disagree with the idea of rating teams rather than individuals. This factor is significantly important because of the Deming belief that individual annual ratings destroy teamwork [Ref 1:p. 7-45]. In this way, the Generals do not encourage team work in the AA. However, question 5 (Table 4-1) shows that the AA top leaders see cross-functional teams as a useful tool to solve organizational problems (four Generals answered "agree" and two "strongly agree"). This position is reinforced by question 9 (Table 4-3) where the generals allocated 25% of their personnel daily working time to "improving team skills," the number 1 ranked option. Questions 5 and 9 show that the role of teamwork is recognized by the AA top leaders as a tool for optimizing the organization. This factor

is important, given that TQL heavily relies on teamwork. The difference of the generals' positions between questions 3, 5 and 9 is probably caused by what Deming calls "deadly diseases." In this case, the disease is: "evaluation of performance, merit rating, or annual review." This finding should be included in the transformation plan as a major issue to be discussed due to the negative effect this disease has on the personnel (see Chapter III.E.3.).

10. Point 10: Eliminate exhortations for the workplace. [Ref 1:pp 7-37]

There were no questions related to this point in the survey.

11. Point 11: (a) Eliminate numerical quotas for production. Instead, learn and institute methods for improvement, (b) Eliminate Management by objectives. Instead, learn the capabilities of processes, and how to improve them. [Ref 1:pp 7-40]

Most of the Argentine Army top leaders do not see their personnel working to achieve a quota. Question 1 (Table 4-1) shows four out of six generals answering that their personnel jobs are not intended to show that something has been accomplished each year (one General answered "strongly disagree" and the other three answered "disagree"). However, there are two generals who understand that Officers and NCOs could be working to reach annual goals. These two generals represent 33.33% of the sample and possibly of the population. It would seem that further research would be needed to check the population reality. Different mental model [Ref 16:p. 174] may be present in the minds of the Generals. Operational definitions (see Chapter III.B.4.) appear to be the proper tools for dealing with this situation.

Point 12: Remove barriers that rob people of pride of workmanship.

Specific actions to make this point a reality do not seem to be taken by the Argentine Army top leaders.

Responses to question 2 (Table 4-1) may be viewed that most of the Generals (four) do not think that the Annual Personal Evaluation (APE) affects long-run projects. However, there are two Generals who think that it does. Rating people is a disease according to Dr. Deming's philosophy. These answers show that AA top leaders should receive further education about this philosophy to allow them a better understanding of their organization and the effects of the APE on optimization.

Question 3 (Table 4-1) shows that five of the Argentinean top leaders do not support the idea of moving from a personal evaluation system to a team evaluation system. Although the Deming ideal for this point is to remove all kinds of evaluation, question 3 proposed an intermediate option. However, even this option was rejected by most of the generals. Thus, AA top leaders do not see the perverse effects that annual ratings have on people, so they do not act against it.

Question 10 (Table 4-1) shows that five out of six Generals believe there is good communication flow in the AA. However, given that poor communication flow can be a major barrier to a TQL transformation, a negative answer by even one respondent is grounds for further investigation.

Questions 11 (Table 4-1) and 14 (Table 4-5) show differences between the generals' thoughts and their actions regarding empowerment, an important TQL concept covered by this point.

In question 11, all of the AA top leaders agree or strongly agree with the idea of empowering lower levels in the chain of command to allow the organization to improve its performance. In question 14, however, the proportion of decisions made by the different hierarchical levels was concentrated at 51.67% at the highest level and 17.5% at the lowest level. As in question 3, a lack of confidence seems to exist from the Generals toward their subordinates.

Question Fourteen: You have 100 points which represent 100 % of all of the peace time normal daily operating decisions your organization makes. Please allocate them among the different hierarchic levels in order to show what percentage of the total peace time normal daily operating decisions each group should make. Please make sure you allocate 100 %.								
Rank	R1	R2	R3	R4	R5	R6	\bar{x}	σ
Senior Officers	50	40	60	60	40	60	51.67	9.83
Junior Officers	30	35	20	30	40	30	30.83	6.64
NCOs	20	25	20	10	20	10	17.50	6.12

Legend: R1 to R6: Each column identifies a different respondent.

Table 4-5. Survey results for question 14.

Support for this Deming point was intended to be analyzed by the use of many different questions because of the large number of critical concepts it addresses, such as: "remove annual rating," "empower lower levels" and "remove barriers which rob the workers of pride of workmanship." When integrating the responses for each question, the conclusion is that some barriers such as the Annual Personal Evaluation (questions 2 and 3) and "bad communication in its organization," (question 10) do not seem to be well recognized by the top leaders. Thus, they are not able to act against what they do not know. The concept of empowering lower levels seems to be shared, but in practice, it is not applied (questions 11 and 14).

13. Point Thirteen: Encourage education and self-improvement for everyone.

[Ref 1:pp 7-45]

Argentine Army top leaders strongly support this point. Question 8 (Table 4-2) shows "education" is the first priority of 9 other organizational and TQL-related concepts. In addition, the "training" concept has been placed in second position. Thus, AA top leaders see education as an issue. This vision will contribute to the support of the TQL transformation because of the need for education to be encouraged.

14. Point Fourteen: Take action to accomplish the transformation [Ref 1:pp 7-51]

This point was not included in the survey because of the feeling that it is premature to ask the generals about their willingness to undertake a strong cultural transformation without a comprehensive background in Deming's philosophy.

C. GENERAL INTERPRETATION

An analysis of the fourteen answers from the Argentine Army Headquarters shows that a fertile field exists in which the Deming philosophy may be able to be instituted.

Important support was found for ideas related to: "create constancy of purpose toward improvement of product and services" (Deming's point 1); "rethinking how the organization is doing business" (Deming's point 2); "end the practice of awarding business on the basis of the price tag" (Deming's point 4); "institute training on the job (Deming's point 6); "institute leadership" (Deming's point 7); "encouraging team work" (Deming's point 9) and "education" (Deming's point 13). This finding allows a conclusion that a significant part of the Deming philosophy is shared by AA top leaders. Thus, the TQL transformation may be able to be undertaken.

Other ideas appear to have less support: "improve constantly and forever the system of production and services" (Deming's point 5) and "drive out fear" (Deming's point 8). An explanation of this lower level of support may be found in the lack of knowledge of systemic theory (Chapter III.B.1.) by AA top leaders and the political role played by AA in the past.

No conclusion could be drawn in relation to "cease of dependence on inspections" (Deming's point 3). The fact that some degree of lack of confidence may exist in the relationship the generals have with their subordinates may impact their willingness to reduce dependence on inspections. Further investigation is needed to show whether significant trust exists in the AA environment to foster a TQL transformation.

Numerical quotas do not appear to be an issue in the AA (Deming point 11). The absence of a strong management by objective program is a positive signal which favors the introduction of TQL.

AA top leaders do not support the idea of removing the annual rating (Deming's point 12). Empowering the lower hierarchical levels, another concept required by TQL philosophy, does not seem to be shared by the top leaders. Modifying these two situations will possibly be the major challenges to be faced when introducing TQL into the AA.

The final conclusion of this analysis, is that TQL principles have a suitable degree of support at the AA Headquarter to proceed with the first stages of a TQL transformation.

V. TRANSFORMATION PLAN

This chapter provides a brief description of the Argentine Army as an organization, takes into account the general interpretation of the conducted survey [see Chapter IV, section C.], and develops a transformation plan aimed at producing the cultural change required to introduce TQL to the AA.

Although this plan is intended to serve the AA as a whole, the same general idea may be applied to any individual effort. Thus, any Officer or NCO may follow the same plan for use in any organization they work with.

A. THE ARGENTINE ARMY AS ORGANIZATION

The Argentine Army is analyzed in this section based upon a diagnostic model developed by Professor Nancy Roberts of the Naval Postgraduate School (see Figure 5-1). The data is the author's subjective evaluation based on 23 years of experience in the AA.

1. External Factors

a. Environment

The economic and political situation of Argentina is completely different now than it used to be. The current government (and its predecessor) limited the budget assigned to the AA at one of the lowest levels in the AA history. Politicians do not see any possibility of conflict in the near future, so from their points of view, there is no reason to allocate resources to the Argentine Army.

The population, undergoing the effects of an economic transformation, requires that the federal government use its resources efficiently. Thus, there is a global trend to downsize the Armed Forces. There is also an increased participation of the AA in United Nation operations.

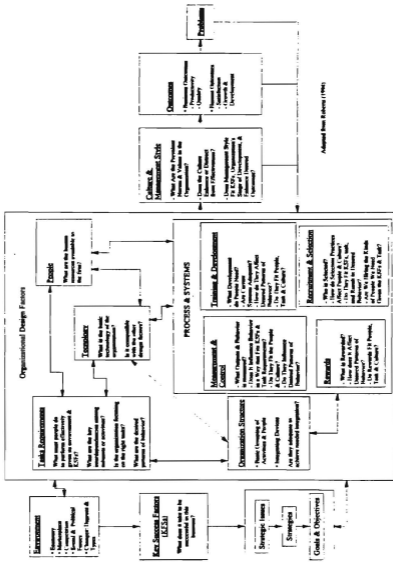


Figure 5-1. Diagnostic Model.

b. Key Success Factor

Although no written documentation was available to validate the key success factors for the AA, it is the opinion of this author and Argentine Army officers in general, that the Argentine Army needs to reach an acceptable level of readiness at the lowest possible cost in all type of activities it performs. The external environment described previously drives this factor. Resources are clearly scarcer year after year, therefore, the AA must use its resources more efficiently.

c. Strategy

It is not in the scope of this thesis to state or analyze the current strategy of the AA. However, like any other army, it may be assumed that the AA strategy is aimed to undertake all needed activities contributing to the achievement of the key success factor stated above to guarantee the national security.

2. Organization Design Factors

a. Task

The basic tasks conducted by the AA may be grouped into two major types: operational tasks and administrative tasks. Operational tasks are those closely related with the deployment of the military power (i.e., maneuvers, UN operations, education, training, etc.). Administrative tasks are basically comprised of the paperwork and other bureaucratic activities necessary to keep the AA moving from the administrative point of view.

Administrative tasks have tied down the AA for years. This administrative gridlock probably happened due to a lack of conflicts over the last one hundred years (only one in 1982 - Malvinas War), as well as through the political role that AA used to play in the country. Today the trend seems to focus on operational activities, but administrative tasks still consume a significant part of the Argentine Army resources.

b. People

The Argentine Army is composed of Officers, NCOs and civilian personnel. Most of the personnel can probably satisfy current AA needs with the current

limitations, but few of them are in a condition to satisfy future needs. The major needs people have in the future are: education, training, and motivation. Due to economic problems (low salary, limited funding to carry out operational activities, etc.), the Army has experienced an important emigration of people from all levels. In general, people with good professional preparation were part of this emigration. Thus, feelings of professional frustration may be perceived from the AA population. Education, training, leadership, motivation and appropriate rewards would help to revert this undesirable feeling.

c. Technology

The technology currently available to the AA was incorporated during the 1970s. The age of this technology critically affects other design factors in the organization. The lack of up-to-date technology has become a barrier to military operations, impeding the development of new military tactics. Personnel, as it was said in the previous point, have feelings of frustration because of current knowledge about the technological situation of other armies in the region. They make obvious comparisons with the AA.

There is also an increasing lack of information technology in the AA. The problems in this area are more notable due to the extraordinary dynamic evolution of this field, as well as an exponential growth of the demand for information at any level. This issue affects all type of activities.

Maintenance, in general, is scarce. Preventive maintenance is almost nonexistent. Corrective maintenance takes place with limitations, sometimes equipment is fixed by taking parts from another out of order piece of equipment.

d. Organization Structure

The Argentine Army is deployed only within Argentinean territories. There are either relatively important concentrations of military forces in one place (a brigade composed of all the army branches including operational or support) or small units in the middle of nowhere. This type of deployment affects the operational and administrative functioning of the AA, but the need to occupy Argentinian territory still exists.

Basically, the AA has a traditional military structure with all the problems of this type of structure (see Chapter III, Section F. 1.).

Information systems, which is a relevant integration device, is one the weakest parts of the organization.

e. Process/System

Recruitment and selection systems have been affected by budgeting cuts during the last decade. Therefore, the possibility of selecting people with a good background in the different fields relevant for the AA has been reduced.

Training and development are also limited by scarce financial resources. In addition, most of the training is accomplished by each branch within the army individually, so the lack of integration is easy to notice. An effort to revert this situation has been through the formation of a School Brigade a few years ago. Its primary responsibility is to conduct education and training for Officers and NCOs.

The units' performance is measured in equal proportion by their operational readiness and their administrative functioning. Evidently officers and NCOs see both as equally important, when they are not. Administrative tasks mainly involve paperwork while operational tasks involve human lives.

The promotion system used to be heavily driven by the seniority (years in the army). For the past few years this system has been studied with the goal of reverting this situation.

3. Culture

Officers and NCOs depend on senior leaders. Officers and NCOs truly believe that their chiefs will take care of them at any time and during any situation. Any other conduct is unthinkable for them.

Informal communication is highly used to solve problems. The lack of an appropriate information system has encouraged this type of communication.

The management style of the AA may be characterized as "loose authoritarianism." After decades of military intervention in the institutional life of the Nation, a feeling of

superpower still remains in some senior leaders. However, a certain degree of openness has been noticed in the last few years.

In general, the AA does not encourage people to move into the technical world. AA officers at the rank of Captain can choose to take their postgraduate studies either in a technical field or in military operations. However, a higher proportion of generals in the AA are composed of the latter choice.

Officers, NCOs, and civilian personnel have shown that they have the necessary military spirit to allow them to overcome countless adverse situations.

4. Outcomes

The main purpose of any army is to fight and win. The AA was defeated during the Malvinas War (1982). This conflict is the unique objective data available to measure AA effectiveness. It is not good.

Quality, as is known in U.S.A., does not exist in the AA. Each person defines by themselves if the product or services they are providing are good or bad. The customer-supplier relationships are also unknown (see Chapter III. Section A.2).

Officers, NCOs, and civilians show a significant degree of dissatisfaction. A lack of resources has led the AA to a latent state. There is no employee growth under these conditions. Exceptions to this general situation may be considered in a few cases where Officers and NCOs have been sent to study overseas. However, when they return, their new knowledge is not always exploited.

Integration is not good. The organizational structure does not have the appropriate information technology to allow work integration. This affects operational and administrative tasks.

5. Problem

There seems to be a mismatch between key success factors, the goal of the AA strategy, and its organization design. The general situation described in this section supports this statement.

B. THE EXPECTED OUTCOME AFTER TQL EFFORT

The cultural change [Ref 1:pp 4-6] created by the introduction of TQL is the main expected outcome. This cultural change should be reflected by the incorporation of Deming's philosophy (see Chapter III, LITERATURE REVIEW) in all activities by every member of the AA.

TQL is not intended to solve the AA problems alone, but it is strongly believed by the author that TQL may become a powerful tool to improve the AA organization.

The current general situation of the AA constitutes a real challenge for this undertaking. Being conscious of this, the author has given only the first steps toward the introduction of TQL to the AA.

C. TRANSFORMATION PLAN

The Transformation plan has been conceived by the author to occur in phases. This decision has its foundation in current literature, as well as U.S. Navy experience in this field. Marshall Sashking says: "...for plan to be successful or having a good chance of being, the implementation must be undertaken in steps...." [Ref 18:p 155]. This concept has also been shared by the U.S Navy (see Chapter III.Section F.3.d.).

The results of the conducted survey (see Chapter IV), the AA description provided in Section A in this chapter, the expected outcome expressed in the previous section, the current literature, and the author's own experience in the AA have guided the definition of each phase.

1. The Steps of the Transformation Plan

The suggested Transformation Plan is therefore composed of three phases:

- Phase I: Top Level Involvement. The main purpose of this phase is to obtain top leader support for a pilot test (Phase II) to be conducted.
- Phase II: Pilot test. This stage is aimed to check this philosophy in the AA on a small scale.

- Phase III: Institutionalization of TQL. The goal of this stages is to create the necessary conditions to favor the adoption of TQL principles throughout the AA.

2. Phase I: Top Level Involvement

The aim of this phase is to reach an appropriate degree of support from top leaders which will provide the opportunity of introducing TQL on a small scale into the AA.

The survey analysis has shown some points of Deming's philosophy that appear to be weak in the mind of the generals, such as strategic planning, systems theory, the effect of annual ratings on people and the effects of fear in the workplace (see Chapter IV. Section B.). This last point should be particularly addressed, given that it appears as part of the AA culture in a management style characterized as "loose authoritarianism". (See Chapter V. A.3.) It is suggested that Deming's philosophy should be better understood and shared by the AA leaders before asking for their support. Given top leaders support for education and training, senior leadership courses seem to be a way to solve this problem. These courses should provide knowledge related to the basic concepts and principles of TQL, process management and improvement, and strategies for creating a TQL transformation.

Assessing the strengths, weaknesses, opportunities and threats (S.W.O.T.) of the AA should also be part of this phase. The outcomes of the SWOT analysis, along with the analysis of the missions and mandates of the Argentine Army (not included in this thesis), may also help to create the necessary foundation for recognizing the introduction of the TQL philosophy as a strategic issue [Ref 6:p 51]. The demonstration of that TQL as a strategic issue might reinforce top leader support. Using the author's knowledge of the AA, SWOT analysis may show the following findings:

- Strengths

- ◆ Officers and NCOs eager to be part of an Army which works more efficiently.
- ◆ Officers and NCOs willing to undertake efforts honoring a historic tradition.

- ◆ Officers and NCOs have an appropriate professional level.
- ◆ High degree of support to many points of Deming's philosophy (7 out of 12 points included in the conducted survey) (See Chapter IV. C.).

- Weaknesses

- ◆ The current salary level is low and it might affect personnel performance.
- ◆ Scarce financial resources.
- ◆ Possible presence of an authoritarian mental model at every level.
- ◆ Current promotion system does not encourage self-education.
- ◆ Some possible degree of lack of confidence from senior officers to their subordinates (see Chapter IV. C.).
- ◆ Presence of one of deadly disease in the mind of the AA top leaders (evaluation of performance, merit rating, or annual review) (see Chapter IV.C.).

- Opportunities

- ◆ The Argentinean society would be very happy to see its Army involved in an effort to improve.
- ◆ Personalities belonging to the academic and business world would be willing to help the AA achieve its TQL transformation.

- Threats

- ◆ The national security may be endangered if the AA does not acquire an adequate efficiency level.

Once top leaders' support has been obtained through education and strategic analysis, the next step is to create a team to be in charge of the pilot test phase. The presence of top leaders on this team is strongly encouraged, because their high rank will contribute to the availability of resources and assist in removing resistance.

3. Phase II. Pilot Test

The goal of this phase is to check the TQL philosophy on the small scale. This will require four major steps:

- **Course adaptation:** The starting point is to adapt part of the standard TQL curricula used by U.S. Navy [References 1 and 14] into the Argentinean culture (basically the examples should be modified for placement within the military environment). This step also provides the opportunity for outside TQL experts (people who do not belong to the AA) to be invited to assist in the TQL course development. The presence of outsiders is considered very important because these people will bring different perspectives and visions to the AA, allowing creativity to be introduced into the courses [Ref 18:p 156; Ref 8:p 110].

Another suggestion (from the author's personal experience) is to include an individual project in each course to encourage each student to define and begin to use a personal quality checklist [Ref 19:p 15]. This tool is a powerful resource that allows the instructor to demonstrate how quality principles can work in real life. This tool can also become an incredible motivator for those who have the opportunity to incorporate these quality principles into their daily lives and see that they work.

- Course development:

In this stage the initial TQL courses are taught on a small scale. A brigade may be an appropriate organization for this purpose, given that within it exists many of the different communities of the Army (all operational and support branches), and it is not an extremely large organization.

The School Brigade is not suggested for this stage given its multiplier effects. Any problem in the course prior to evaluation could generate adverse reactions by the course attendees which may spread to the entire Army, creating a strong barrier that could be impossible to remove.

Fast-feedback questionnaires [Ref 19:p 96] could be used during this step. This would allow course attendees to provide opinions about the course for use as immediate course improvement. However, a final and more formal survey should also be given at the end of the course.

- Improvement Projects:

This step is aimed to encourage the course attendees to integrate the new theories learned in practical and real applications.

Small improvement projects should be selected at first. The idea is to guarantee to the attendees the possibility of success in their efforts, avoiding initial frustration. The projects should embrace both operational and administrative tasks. An external consultant or facilitator should be available to assist the teams while doing improvement projects.

- Evaluation:

The purpose of this step is to evaluate if the TQL philosophy will fit into the AA context. For this conclusion to be reached, a formal survey should be conducted on all personnel involved in the three previous steps to understand their perception about this new philosophy. A deeper diagnostic survey of AA as an organization also should be carried out with the purpose of identifying all barriers present from the TQL point of view. For instance, the feeling of dissatisfaction present in the people, the lack of enough education and training, the current promotion system, the management style (loose authoritarianism), the lack of integration, the possibility of a lack of confidence being present in the generals-subordinates relationship, and the presence of one of Deming's deadly disease, etc. A strong suggestion by the author is to involve outsider analysts in the diagnostic of the AA. These people will assist the AA in viewing the organization from a different perspective, allowing them to recognize barriers or problems that are difficult to see within the organization.

The team formed in Phase I, along with advisors from the academic and business world, should make an evaluation of this phase and provide advice to the AA whether to make the decision to go forward to the next phase or to give up this plan.

4. Phase III: Institutionalization of TQL

Although this thesis primarily focuses on the first two phases, general information is provided for the third phase: the institutionalization of TQL in the AA. The major activity suggested to reach this goal is to form an Executive Steering Committee (ESC) for the entire AA, composed of the Chief of the AA and other high ranking Officers. The ESC must show the conviction of the AA top leaders to accomplish the TQL transformation in accordance with Dr. Deming's point 14 [Ref 2:p. 86]. The ESC's general responsibilities were provided early in the Literature Review (see Chapter III. Section F.3.c.(1)). However, in the particular case of the AA, the author believes that the AA ESC should focus its initial efforts on: developing and adopting a quality leadership philosophy, removing barriers and reinforcing education and training (see Phase II, evaluation, earlier in this section and Chapter IV. B. and C.). Once these issues are addressed, the successful introduction of TQL in the AA should occur.

The AA ESC should evaluate when the conditions are ready to introduce TQL education to the whole AA. Teaching TQL to all military personnel should only be started once the major problems have been solved. This plan will show a strong commitment of the top leaders to this philosophy.

The ESC must also ensure that the proper resources are available to support the TQL supporting roles (see Chapter III.F.3.c.(5)) necessary to create an infrastructure for the growth of TQL.

VI. CONCLUSIONS AND RECOMMENDATIONS

This thesis assesses the applicability of TQL in the Argentine Army. A survey was developed by the author and analyzed in Chapter IV to determine if the Argentine Army staff supports TQL principles. Based on this analysis, an implementation plan was developed in Chapter V. This chapter includes a discussion of the conclusions and recommendations from this study.

A. CONCLUSIONS

In relation to the first research question: "Is TQL applicable to the Argentine Army?" (Chapter I.B.2.), the following conclusion was drawn:

- ◆ TQL principles are, in general, shared by the Argentine Army staff; but the Argentine Army organization has problems which should be resolved before starting the TQL transformation.

The survey analysis conducted in Chapter IV shows that TQL principles have a suitable degree of support within the AA staff. This statement relies on the fact that only two of the twelve Deming points in the survey were identified to be problems. These points are: (1) "cease of dependence on inspections" (Deming point 8), where no conclusion could be drawn and (2) "remove barriers that rob people of pride of workmanship" (Deming point 12) which, seems to be rejected (see Chapter IV, sections B and C). However, concepts like strategic planning and systemic vision appear as weaknesses in the survey and need to be reinforced (see Chapter IV, A.1. and 5).

Where analyzing the AA as an organization, the existing mismatch between key success factor, the strategic and organizational design factors was considered to be a problem in the AA (see Chapter V.A). This mismatch currently affects the culture of the organization and the culture is just what TQL is expected to change. The suggestion is that if a new culture is to be built in the AA, the organization as a whole must be redesigned in accordance with the desired culture.

In relation to the second research question, "... What steps need to be taken to create the TQL transformation?, the conclusion is:

- ◆ The transformation plan developed in this thesis appears to be an option.

The transformation plan developed (see Chapter V. C.) provides a sequential set of phases, each one with a clear objective planned in accordance with current literature, the experience of the U.S. Navy in this field, and the unique characteristics of the Argentine Army. -

B. RECOMMENDATIONS

- ◆ Implementation the transformation plan as described in Chapter V.
- ◆ Following Phase II of the transformation plan, the decision should be made whether TQL is to be introduced in the Argentine Army or not.
- ◆ A deeper diagnostic of the Argentine Army as an organization should be conducted by military personnel and outsiders to identify all existing barriers within the AA to TQL philosophy.

This diagnostic of the AA as an organization provided by this thesis (see Chapter V.A.), has limitations from being from the perspective of the author alone and being conducted from the U.S. Although the author believes that the big picture is provided within the scope of this thesis, the author is also conscious further study must be completed for the transformation plan to be applied in reality. In addition to the author's viewpoint, as a member of the Argentine Army, outsider opinions and expertise should be gathered.

- ◆ The TQL philosophy should be spread into all activities of the AA. TQL should not be viewed as the property of any department, division or unit of the AA.
- ◆ A TQL transformation must not be undertaken if the necessary resources (financial, personnel, time, etc.) are not available or the commitment of the top leadership has not been reached.
- ◆ Further research is recommended to study possible alternatives for replacing the method of merit ratings currently used in the Argentine Army, as well as other organizations.

APPENDIX: QUESTIONNAIRE

This questionnaire is designed to obtain your thoughts about different aspects related to your job. Your frank, candid opinions are important and sincerely welcome. Please read each question carefully before responding. Most can be answered by simply placing an "X" above the word that most nearly represents your opinion. Completing the questionnaire requires only few minutes of your time.

Your answers will be kept completely confidential. Therefore, please do not sign your name to this questionnaire. The information you provide will be added to that of other participants for purposes of data analysis.

Your assistance in this effort is appreciated.

Question 1 to 7, place a "X" above the word which most nearly reflects your opinion (just one word can be selected).

1. Do you think the Annual Personal Evaluation requires officers and NCOs to focus on short term results in order to show that something has been accomplish each year?

Strongly disagree	Disagree	Undecided	Agree	Strongly Agree

2. Do you think the Annual Personal Evaluation affects long-run projects?. Such as changes of poeple's behavior which can not be seen in less than 2 o 3 years.

Strongly disagree	Disagree	Undecided	Agree	Strongly Agree

3. What do you think of replacing the Annual Personal Evaluation by a Biennial Team Evaluation? (ie: a qualification for the company as a whole, for the section)

Strongly disagree	Disagree	Undecided	Agree	Strongly Agree

4. What kind of plan do you prefer undertaking in your organization?

Short-run plan (less than 1 year)	Middle-run plan (1 to 3 years)	Long-run plan (more than 3 years)

5. Do you see cross-functional teams as a tool to solve specific problems in the organization you are in charge of? **NOTE:** Cross-functional teams are those teams composed by persons coming from different functions within the organization.

Strongly disagree	Disagree	Undecided	Agree	Strongly Agree

6. Do you see it is necessary to rethink how your organization is doing business?

Strongly disagree	Disagree	Undecided	Agree	Strongly Agree

7. What do you think about making inspections using a sampling Of parts of your organization rather than mass inspections?



8. You have 100 points, please allocate them to the options below to reflect their relative importance for your organization. Please make sure you allocate 100 points.

- Acquisition of new material _____
 - Education. _____
 - Down sizing. _____
 - Training. _____
 - Leadership. _____
 - Projecting a good image. _____
 - A strategic plan for improvement. _____
 - Continuous improvement of process. _____
 - Identify and satisfy those who receive our jobs _____
- TOTAL ---> 100

9. You are in a position to distribute the eight hours of daily working time of the people working for you. How would you allocate these hours among the different options? Please make sure you allocate 8 hours. Assume peace time.

- Administrative tasks. _____
 - Learning something new. _____
 - Improving personal skills. _____
 - Improving team skills. _____
 - Improving process. _____
 - Talking with people they support. _____
- TOTAL---> 8

Questions 10 through 13, place an " X " above the word which most nearly reflects your opinion. (just one word can be selected)

10. Do you think that your organization has a good flow of communication among different hierarchic levels such that new ideas are allowed to arise easily from the lower levels up to your level?

Strongly disagree	Disagree	Undecided	Agree	Strongly Agree

11. Do you think it would increase your organization's performance to empower the lower levels in the chain of command to make more decisions?

Strongly disagree	Disagree	Undecided	Agree	Strongly Agree

12. Do you think that your organization should select its suppliers by the quality of their products rather than by the price tag of them?

Strongly disagree	Disagree	Undecided	Agree	Strongly Agree

13. Do you think it is necessary to eliminate from your organization anyone feeling threatened by possible repercussions as a result of speaking up about work-related concerns?

Strongly disagree	Disagree	Undecided	Agree	Strongly Agree

- =====
14. You have 100 points which represent 100% of all of the peace time normal daily operating decisions your organization makes. Please allocate them among the different hierarchic levels in order to show what percentage of the total peace time normal daily operating decisions each group should make. Please make sure you allocate 100%.

Senior Officers: _____
Junior Officers: _____
NCOs : _____

Thank you for your time.

You have finished this questionnaire. Now the last contribution is needed. Please send the questionnaire back using the attaché envelope as soon as possible, the results are needed to complete a study which may contribute to improve our army.

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